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ABSTRACT

Four alternative government farm policies were analyzed to determine their effect upon farm income and employment generation in rural areas and agriculturally related industries. A linear programming model of interregional competition was used to determine the impact of alternative farm policies on the quantity of major commodities produced, the regional location of that production, and net farm income. Divided into 150 homogeneous rural areas and 31 consuming regions, U.S. agricultural production was defined in terms of commodity demands for wheat, feedgrains, soybeans, cotton lint, and cottonseed oilmeal. The impact on income and employment generated outside agriculture and that generated specifically in the North Central Region was also examined in terms of the 4 farm policies. The policies examined were: (1) Free Market Alternative (no direct government intervention in the market either through price supports or direct payments); (2) Land Retirement Alternative (governmental price supports for feedgrains, wheat, and cotton and direct government payments to farmers for witholding part of their production); (3) and (4) Bragaining Power Alternatives A and B (under both alternatives, farmers would unite to exert control over market prices and production, the major difference being the level of farm prices which would prevail). (JC)

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INCOME AND EMPLOYMENT GENERATION IN RURAL AREAS IN RELATION TO ALTERNATIVE FARM PROGRAMS

WITH SPECIAL EMPHASIS ON THE NORTH CENTRAL REGION

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INCOME AND EMPLOYMENT GENERATION IN RURAL AREAS IN RELATION TO ALTERNATIVE FARM PROGRAMS WITH SPECIAL EMPHASIS ON THE NORTH CENTRAL REGION

by

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Preface

The persistent trend toward larger and fewer farms, increased agricultural productivity, and a reduced agricultural work force has had important impacts on the employment and income of both the farm and non-farm sectors of rural areas for the last two decades. The shift to fewer and larger farms, accompanied by a reduced work force and population in agriculture, has greatly reduced the volume of business and employment in rural towns. Accompanying this reduced income, employment, and population has been an additional set of complex problems. The thinning of the rural population has increased the per capita costs of services and tended to cause those services relating to family and human needs to deteriorate in quantity and quality.

The rapid transformation of agriculture, until the recent quantum jump in world demand for U.S. farm commodities, caused supply capacity of American agriculture to exceed demand at prices generally acceptable to the farm public. To compensate for this surplus supply capacity, farm programs were in affect during the 1960's and early 1970's which reduced commodity supplies and supported prices thus preventing the burdens of rapid technological advances from falling entirely on farmers. Accompanying these programs were large public payments to farmers for idling land as a supply control means. These programs tended to bring income directly into rural communities through payments to farmers and indirectly through improved prices and incomes. In the absence of these programs, farm prices and incomes would have been much lower. However, the national pattern of agricultural production also would have shifted for two reasons: (1) In the absence of farm programs and farm allotments (or eligibility bases distributed geographically), no public restraints on the spatial distribution of agriculture would have prevailed. Consequently, production of commodities would have shifted and concentrated in regions of comparative advantage under recent technologies and demands. (2) Lower commodity prices and reduced farm incomes would have speeded and augmented these shifts as production become unprofitable in some areas under conditions of supluses, a free market, and unsupported prices.

Also the level and geographic distribution of nonfarm rural income would have differed greatly in this period under alternative conditions of free markets and various types of farm programs. This study has been made to measure the effects of different types of farm programs and domestic market conditions on the income and employment of rural communities. It is possible and likely that the nature of farm programs has greater implications for rural employment and income of typical rural communities than industrialization, subsidized services, and other programs popularly proposed for them. Studies such as this provide an improved quantitative base for assessing the outcome under these alternatives.

The analysis refers to market conditions prior to the large increase in export demand following shortfalls in world harvest for the 1972 and 1973 seasons. Part of this demand may prove temporary and conditions of supplies, market conditions, and surpluses of the past may again return to American agriculture. If so, as farm programs are altered for these purposes, it is important to know their impacts on rural community income as well as that for farms.

I. - INTRODUCTION

The nation's agriculture has made rapid advances in productivity over the past three decades. Reflecting this growth in productivity, output per farm worker increased by 237 percent between 1947 and 1970. This exceeds the 64 percent increase registered by all nonfarm sectors in this time period. The rapid growth in farm productivity has greatly added to national economic growth. Because of this growth in labor productivity, agriculture reduced its work force by 6.5 million over the same period. Labor thus was freed to produce other goods and services desired by consumers. Also improving consumer welfare has been the declining real costs of foods, represented by the "farm gate" costs of foods to consumers, and the declining proportion of personal income which must be devoted to food. Between 1940 and 1970, the proportion of personal income spent on food declined from 21.9 percent to 16.6 percent, an amount considerably lower than for any other country in the world.

Mixed blessings have, of course, accompanied this rapid growth in farm productivity. Paralleling the greater output per worker have been increases in land productivity or per acre yields. Yield per acre of all farm crops in the United States increased by 50 percent between 1940 and 1970. Increases were 152 percent for corn, 129 percent for all feed grains, 65 percent for soybeans, 103 percent for wheat and 74 percent for cotton. Similar advances have been made in livestock productivity as feed required to produce 100 pounds of product has declined greatly for pork, poultry, and dairy products. Increased land and labor productivity for crops and increased feed efficiency for livestock have effectively increased land supply and food producing capacity. Relative to domestic population and food demand, producing capacity is much greater than at any time in the nation's history. Because of the great capacity of American agriculture induced by rapid technological and productivity advance, food supply has been great relative to demand for most of the postwar period. Because of low price elasticities of demand, this enlarged farm productivity has reduced total and net farm revenue in the absence of farm supply control and price support programs for much of the post-war period.

The growth in labor productivity, along with favorable prices of machine capital relative to labor, not only has directly reduced the farm work force but also has done so indirectly as it brought about pressure for larger and fewer farms. Reduced labor requirements in agriculture (Table 1) typically have required that farm family workers look elsewhere for employment. Since employment alternatives have been absent in many rural communities, persons replaced from agriculture have migrated to other locations with growing industry and employment opportunities. With this exodus of farm workers and families, rural towns and businesses have been faced with a declining demand for the goods and services they supply. The majority of rural communities experiencing a rapid growth in farm productivity and a decline in the agricultural labor force have had a great decline in nonfarm economic activity, employment, and capital value of business establishments. Consequently, rural communities that are primarily dependent on agriculture have been losing population at a rate paralleling the decline in the farm labor force.

Under the realization that rapid farm technological advance, which

Table 1. Workers employed in farming, index of man-hours of farmwork, and index of farm output per man-hour used in farming 1950-70.[a]

Year	Number of Workers	Man-hours of farmwork	Output per man-hour
	(Thousands)	(1950 = 100)	(1950 = 100)
1950	9,926	100	100
1951	9,546	100	103
1952	9,149	96	111
1953	8,864	92	117
1954	8,651	88	123
1955	8,381	85	134
1956	7,853	79	143
1957	7,600	73	151
1958	7,503	70	169
1959	7,342	68	177
1960	7,057	65	191
1961	6,919	62	200
1962	6,700	60	209
1963	6,518	57	229
1964	6,110	54	237
1965	5,610	51	260
1966	5,214	49	269
1967	4,903	48	286
1968	4,748	46	303
1969	4,589	44	320
1970	4,523	43	323

a/ Source: 1971 Handbook of Agricultural Charts, Agricultural Handbook No. 423, pp 11 and 16, USDA, November 1971.

caused food production to increase more rapidly than demand, could increase welfare of consumers at the expense of income to farmers, the nation initiated supply control and price support programs during the 1930's. Except during periods of war-inflated demand, the United States has had some type of supply control, price support, and export subsidy in effect for the last three decades. The logic behind these programs has been this: If growth in output could be restrained to mesh more nearly with the rate of growth in population and food demand, consumers could be brought gain in the form of a declining real cost for food while farmers could realize increases in per family income. In general, these programs have been able to meet their objectives in guaranteeing increased consumer welfare and supporting farm income. Previous studies [in this series] show that net farm income in the nation would have been around 25 percent lower in the absence of price support and supply control programs of the kind in effect over the last decade.[1] While per farm income has increased (Table 2), this increase has been due to larger and fewer farms and general inflation as well as to government programs of supply management, price supports, and export subsidies.

Farm programs have not completely closed the gap between farm and nonfarm income levels (Table 2). Certainly, net farm income would have been much lower over the last decade in the absence of supply control and price support policies. To an important extent, the public has been successful in its attempt to protect farm income while allowing consumer gains

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[1] L.V. Mayer, E.O. Heady and H.C. Madsen; Farm Programs for the 1970's. CAED Report 32, Center for Agricultural and Rural Development, Iowa State University, 1968.

Table 2. Per capita disposable personal income of the farm population as a percentage of the per capita disposable personal income of the non-farm population, and realized net income per farm, by sales classes, 1960-70.[a]

Year	Per capita farm as percentage of non-farm	Net income per farm by sales class:			
		$40,000 and over	$20,000 - 39,999	$10,000 - 19,999	Under $10,000
	(Percentage)	(Dollars)			
1960	54.5	18,955	8,652	5,368	1,588
1961	59.8	21,309	9,293	5,739	1,676
1962	61.4	21,415	9,153	5,708	1,637
1963	64.3	21,902	9,061	5,648	1,593
1964	62.4	23,301	9,531	5,985	1,667
1965	71.4	25,451	9,937	6,199	1,683
1966	75.1	30,028	10,978	6,664	1,769
1967	72.8	25,171	9,817	6,061	1,648
1968	73.4	25,478	9,988	6,201	1,689
1969	76.5	28,668	10,690	6,588	1,779
1970	74.9	25,664	9,962	6,208	1,697

[a] Source: Farm Income Situation, USDA ERS, July 1971.

in reduced real prices for food in recent decades. Similar protection has not been provided, however, to the nonfarm strata of rural communities. The higher farm income under government programs, of course, brings more employment and business to rural towns as farmers invest more in producers goods and have higher family expenditures for consumer goods and services. However, indirect support of these rural business transactions, through government programs that increase farm income, does not offset the decline in rural employment brought about by increased sizes of farms and a reduction in the farm population and labor force. Even with the support of farm income through the government programs of the last two decades, employment opportunities in towns of typical rural communities have declined as the number of farm families has decreased. Further, rural business owners have experienced a decline in capital assets as business opportunities were eroded by the reduction in the farm work force and as stores, buildings, and other facilities have come to have little value. This decline in capital values for rural businesses contrasts with the outcome for farmers. Advancing technology in combination with governmentally supported prices and direct payments for land retirement have caused the value of farmland to rise rather continuously over the last two decades. Even the owners of smaller farms, impelled to leave agriculture because of growing capital requirements and a cost-price squeeze for low volumes, have been able to realize an increased value for their assets. In contrast, many rural businessmen not only have had to cease operations because of declining demand, but also have been able to salvage little of previous investments in buildings and facilities.

While the rural nonfarm sector would be worse off in the absence of government programs of the conventional kind, these effects do not compensate rural businesses who have suffered a decline in economic opportunity and asset values caused by the widespread substitution of capital technology for farm labor. While not all farmers have realized benefits from farm programs, their loss induced by technological change in agriculture has not been as great as their neighbors in small country towns. Society has been much more effective in compensating the farm sector than it has in redressing income and capital losses of the nonfarm sector in rural areas.

In recent years the public has become increasingly concerned with the plight of rural communities. This concern stems partly from the continuous migration of famililies from rural areas and the growing social congestion and environmental degradation of large urban centers. However, concern over the welfare of rural nonfarm families per se has been growing more intense. Several federal programs have been initiated in attempts to improve economic opportunity and retard deterioration of living conditions in rural areas. These programs emphasize tax relief, rural industrialization, and improvement of services such as water and sewer systems. Some rural communities do have prospects of a "turn around" in their economic opportunities through rural industrialization. More, however, cannot expect to have previous reductions in employment and economic opportunity restored through this means. They are lacking the proper endowment in location, transportation facilities, capital supplies, augmenting industries already in place, and the other characteristics that attract new plant locations. It is possible that their welfare will be affected almost entirely by the prosperity of their surrounding farm industry in combination with public service reorganizations or subsidies which lessen tax burdens and improve the quality of health, recreation, and other consumer services.

This study has been made accordingly. It investigates the economic impact of different types of farm programs on income generation in rural communities and agriculturally related industries. The study was done not as a suggestion that the foundation of programs to rescue rural communities be through programs for commercial farmers. It was completed to evaluate the manner in which income and employment in sectors other than farming are affected by farm programs. [These secondary effects for rural communities may be equally as important as those for farming in choosing among future farm programs.] While the farm population is now only 9.7 million, the population of nonmetropolitan areas in total is 63.8 million.

The analysis devotes a considerable amount of detail to the effects of different farm programs on the farm sector. It is the level of farm income, of course, that is important in inducing the multiplier effects which cause increments in employment and income to spread throughout the typical rural community. The distribution of crop acreage and the quantity of crops produced over the nation are important in determing where and how much fertilizer, machinery, and other farm inputs will be purchased, and the quantity of crops to be handled and processed in rural areas and nonfarm industries. We then examine the secondary impact of the same farm programs on income and employment of the nonfarm sector. Special attention is devoted to the effects within the North Central Region.

A single type of farm policy is analyzed in this study. It relates to the amount and distribution of farm product supplies and the associated levels of prices to farmers. It does not deal with programs which might directly control the number and sizes of farms and indirectly the number of farm families and workers in rural areas. These variables are of great importance to the income and welfare of rural communities at large. A subsequent study will deal with the relation of farm size and related variables to the income and employment of rural areas.

II. OBJECTIVES

The major objective of this study is to measure the economic impact of several types of farm programs on the income and employment generated in rural areas and agriculturally related industries. Focus is on this objective because of passage of the Rural Development Act of 1972 and the preparation of the nation to initiate various programs to promote greater employment and improved living conditions in rural communities. Farm programs represent one means of generating employment and income in the nonfarm sectors of rural communities. Choices and decisions on the best means to improve income and quality of life in rural areas could be best facilitated if information were available on the amount of income and employment generated by both private and public investment in rural industrialization, farm programs, public services and other alternatives. However, this study concerns itself with only one of these alternatives; namely, the income and employment generated by four different farm programs.

Since income and employment generation through farm programs is affected directly by the amount and distribution of crop production and the resulting levels of farm profits, an auxiliary but also major objective of the study is to analyze the impact of four alternative farm programs on the acreage and production of major field crops and on net farm income. A third major objective of the study is to make a detailed analysis of the economic impacts of these same farm program alternatives within the North Central Region.

The order of presentation is as follows: First, the methods and parameters employed in the study are summarized. Next, the secondary or

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multiplier effects of the farm programs in generating income and employment are presented and explained for the entire nation. This is followed by a discussion of the impact of these programs on income and employment in the North Central Region. Next, the effects of the four policies on the distribution of cropland acreages, the production of crops, net farm income and food costs are summarized.

III. METHODS AND TERMINOLOGY USED

The following sections describe the policy alternatives analyzed, the regions used for summarizing results, and the variables used in the study to indicate economic well-being of rural groups.

Policy Alternatives Considered

Four alternative government farm policies are analyzed to determine their effects on both (a) farm income, and (b) employment and income generation in rural areas. These policies were not selected as recommended solutions to the "farm problem" but are programs currently under discussion. Also, they vary widely in their nature and their direct impacts on agriculture. By examining these particular alternatives, we hope to provide a quantitative understanding of the trade-offs and secondary effects that various types of farm policies can have on different sectors of the rural economy.

The first solution estimates patterns of production and income effects that might prevail if agriculture operated in an unrestrained market environment. The forces of supply and demand and market equilibrium alone would determine prices farmers receive for their goods. Direct government intervention in the market through price supports and direct payments to farmers for retiring part of their cropland would not exist. This model will be referred to as the Free Market Alternative.

The second solution or policy alternative is a land retirement program. The program is similar to the type of program in effect in the late 1960's (and in the early 1970's, except for the set-aside modification). This program requires government price supports for feedgrains, wheat and cotton. It also includes payments to farmers to divert part of their cropland from the production of specified commodities. Per acre payments to farmers for land diversion are projected at levels consistent with payments existing in the late 1960's and early 1970's. The program is referred to as the Land Retirement Alternative or the base alternative.

The third and fourth solutions simulate conditions of production, resource use, income, and employment if farmers effectively united to exercise market control over the supplies and market prices of the commodities they produce. The implementation of these program alternatives (referred to as Bargaining Power Alternative A and Bargaining Power Alternative B) might take the form of national legislation to allow formation of national commissions with appropriate powers. These commissions would determine price levels for farm products and the production quotas necessary to equate farm product supplies with demand at the specified price levels.[1] The need for direct government intervention would be eliminated under these programs if farmers could effectively control supply. The Bargaining Power Alternatives in this study use production quotas to force the location of production for these alternatives to be consistent with historic production patterns. The two models differ only in the level of farm prices (see Table 4).

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[1] For a more extensive discussion of the concept of bargaining power and proposals for national legislation in this area, see H.C. Madsen and E.O. Heady; Bargaining Power Programs: Estimated Effects of Production Net Farm Incomes and Food Costs for Specified Price Levels. CARD Report 39, Center for Agricultural and Rural Development, Iowa State University, 1971.

Regions Used in Analysis

Both the linear programming model and the impact analysis are based on various regional or area concepts. Throughout this report, the results of these models will be summarized at three levels of aggregation: a) national, b) 10 farm producing regions, and c) 150 rural areas. These rural areas (Figure 1) are for the continental United States and define homogeneous areas of farm commodity production. They were developed with the restriction that they follow county boundaries and production from areas not included in the 150 rural areas was accounted for outside of the programming model. (Allowance was made for this production in estimating demands for the major farm commodities.)

Consumption of wheat, feed grains, and oilmeals is defined for 31 consuming regions (Figure 2) which follow state lines and account for the entire continental United States. Cotton lint demand is only determined on a national basis.

Certain results from the study are summarized by 10 farm production regions, the third regional concept used in the study. These regions (Figure 3) coincide with the farm production regions used by the Economics Research Service, United States Department of Agriculture.

Linear Programming Model

A linear programming model was utilized to obtain the quantitative results pertaining to farm production levels. The model is detailed in nature and was constructed to recognize the land restraints of the important agricultural producing regions and demand or food requirements in consumer markets. It allows specification of acreage, crop production, and

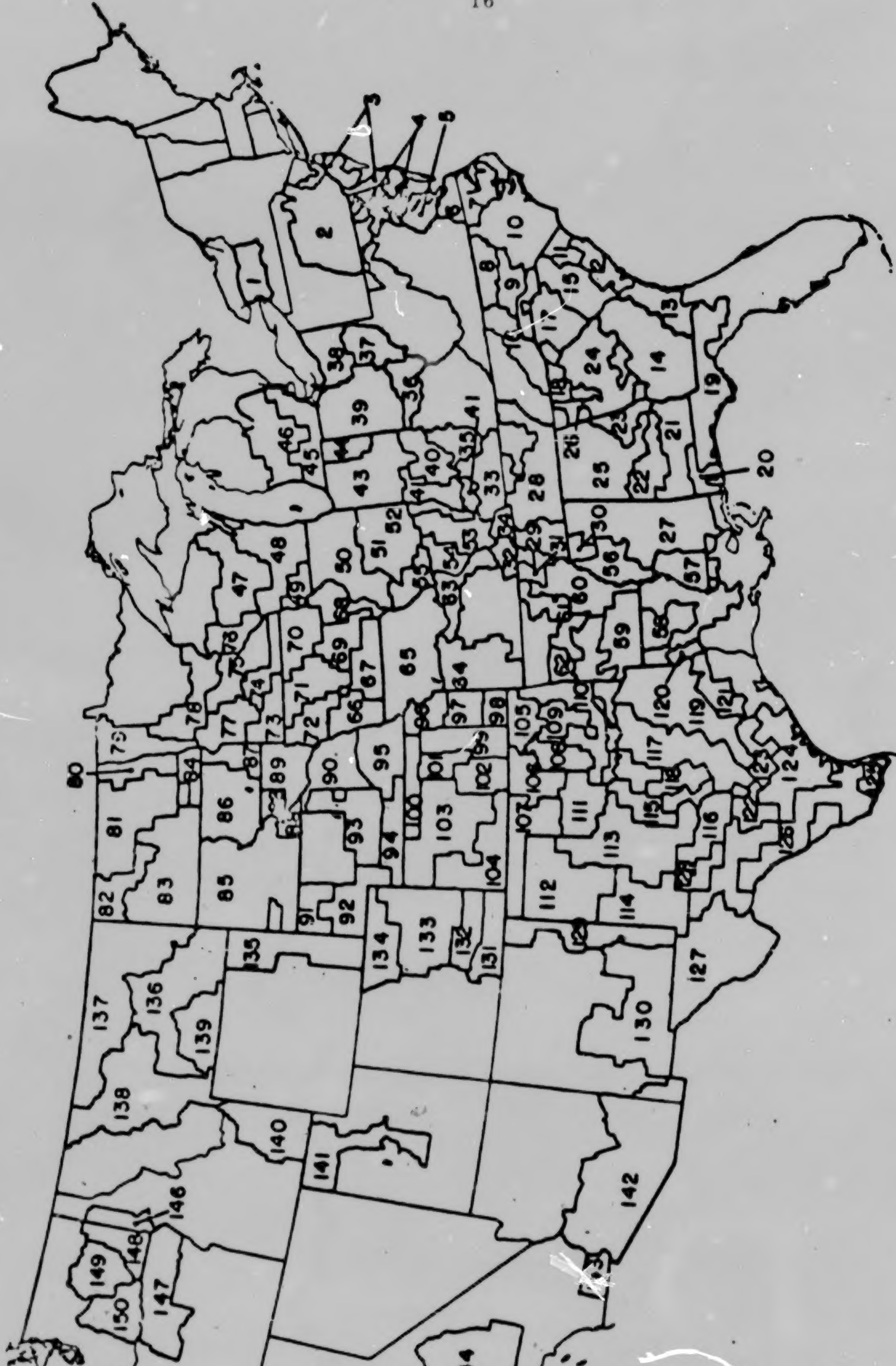
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Figure 1. Location of producing areas used in this study.

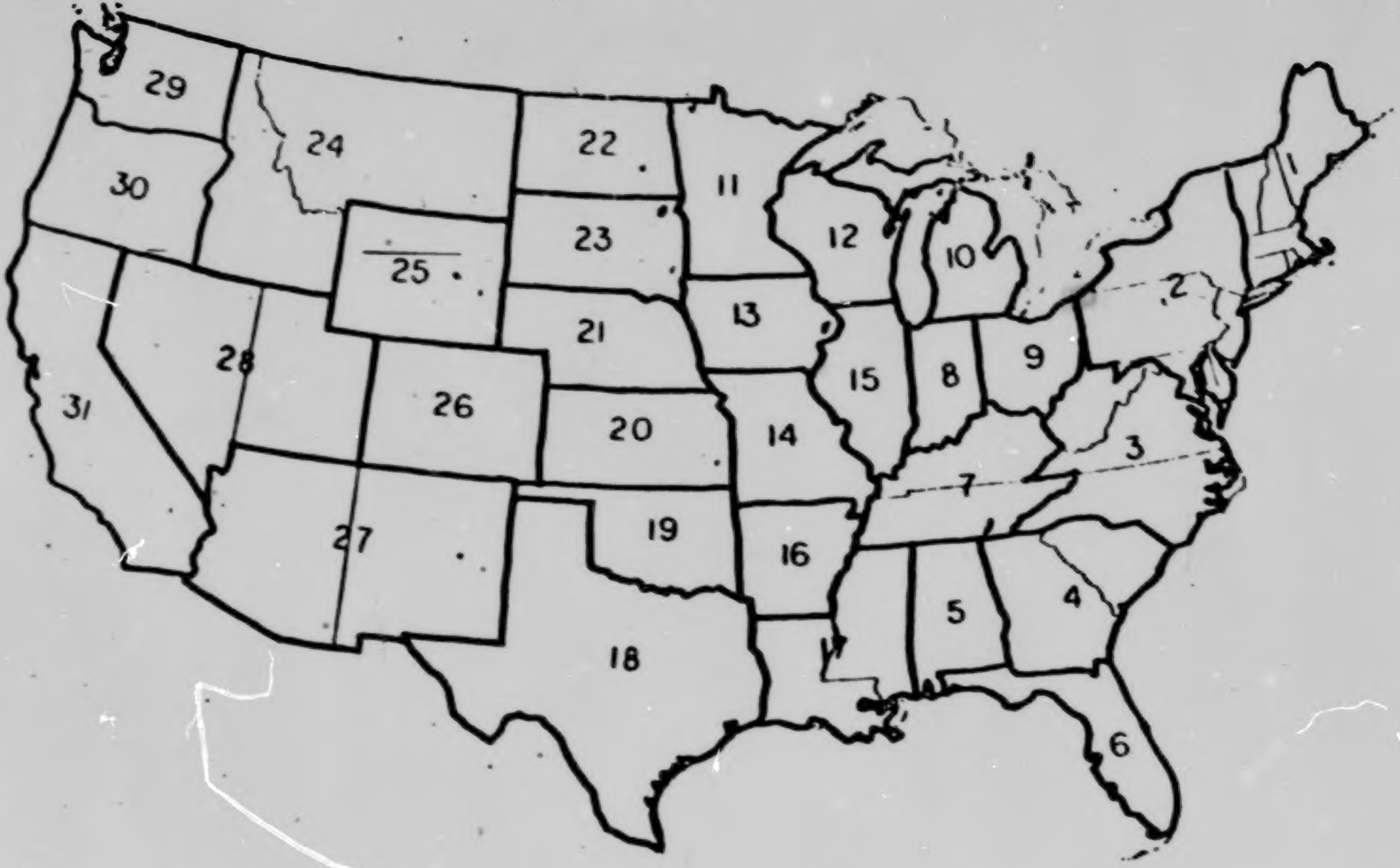
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Figure 2. Location of consuming regions used in this study.

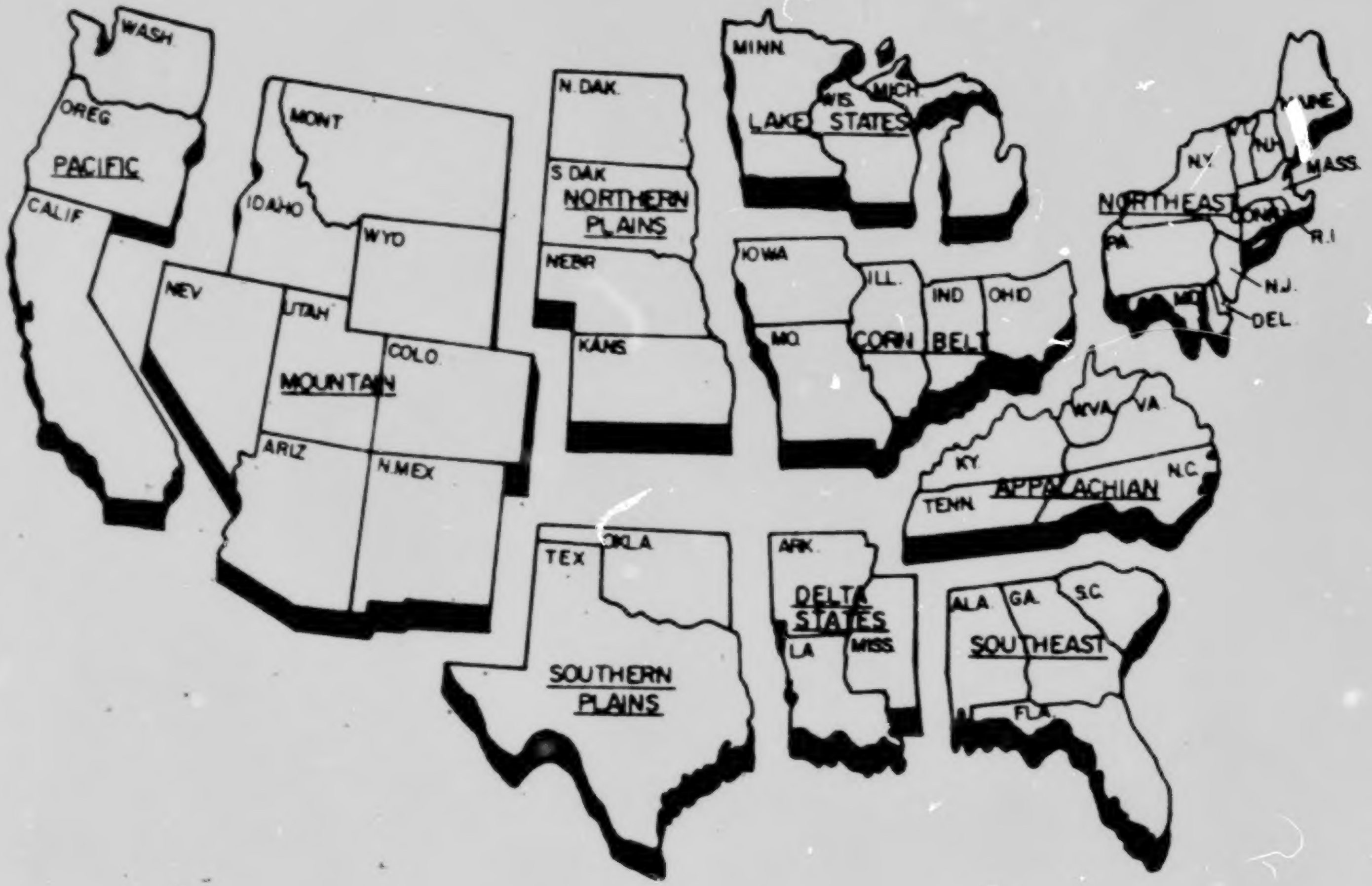
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Figure 3. Ten farm production regions.

income by 150 rural areas. And by incorporating a transportation network or submodel, the overall programming model also reflects interregional competition among the agricultural supply and food market areas of the United States. Each of the farm program alternatives was analyzed with this model. Two-hundred forty-four equations and 2,226 real variables are contained in the model. Land in each of the 150 rural areas and demands of each of the 31 market or consuming regions serve as constraints. Variables encompass not only farm commodities but also transportation activities for each commodity. (The general nature of the model is outlined in Appendix A.)

Secondary Impact Variables

The effects of the four farm policies on the income and employment levels of agriculturally related communities and industries are estimated through factors that relate the value of output determined in the linear programming solutions to the total amount of economic activity which would result from the production of the study's endogenous crop commodities.[1] To determine these employment and income generation effects, the following two variables are linked with the linear programming model.

Income Generation Factor: The amount by which the total income in the United States economy will increase because of production of an additional $1 million worth of output in a sector (the sector of relevance is a specific farm commodity produced in a specific farm production region).

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[1] The crop commodities endogenous to this study are wheat, feedgrains, soybeans, and cotton. The basic coefficients used in developing these secondary impact factors are reported by Schluter (Schluter, "An Estimation of Agricultural Employment Through an Input-Output Study" unpublished Ph.D. dissertation. Iowa State University, 1971). For a discussion of the methods used to calculate the income and employment factors of this study, see Appendix B.

This increase in income has three components: (1) the income received by the producers of the additional $1 million worth of farm output, (2) the income resulting from the increased activity in agri-business industries (through increased sales of productive inputs to farmers and the additional sales of industries that process farm products), and (3) the income resulting from increased sales of consumer goods to farmers and workers in agri-business industries. For example, the income generation factor of 1.35 for wheat in the Northeast region implies that the production of an additional $1 million worth of wheat in the Northeast region would result in an additional $1.35 million of income being generated throughout the economy of the United States.

Labor Generation Factor: the number of additional workers required in the United States economy because of the production of an additional $1 million worth of output in a sector (the sector of relevance is a specific farm production region).

This increase in employment also has three components: (1) the additional farm workers needed to produce the additional $1 million worth of farm output, (2) the additional workers required by agri-business industries which sell more inputs to farmers and have more farm output to process because of the additional $1 million worth of farm output, and (3) the additional workers required by industries that produce consumer goods demanded by farm workers and workers in agri-business industries. For example, the labor generation factor of 228 for wheat in the Northeast region means that a $1 million reduction in wheat production in the Northeast will eliminate the need for the employment of 228 workers throughout the United States economy.

The labor and income generation factors (Table 3) were developed from data for the 10 farm production regions. Hence, they also are based on and relate to the 10 farm production regions. As might be expected, cotton generally has the greatest impact on the economy per dollar of output for both the employment and income generation factors. Since cotton is not produced in the Northeast, Lake States, or Northern Plains regions, there are no entries made for cotton in these regions in Table 3. The relative importance of the other three commodities varies with the factor and the region being considered. Feedgrains have consistently a larger income generation factor than wheat or oilmeals in all of the regions. The size of the Labor generation factor or the Income generation factor varies by regions according to the nature of the crop and the technology generally prevailing in the various regions. Of course, the total amounts of income and employment generated by the production of a crop are functions of the acreage and output of that crop in each of the regions. The factors (Table 3) reflect only income and employment effects per $1 million worth of output.

Development of Indices

To measure the impact of the different farm programs on producers and on rural communities, the income and labor generation factors were linked with the crop production results of the linear programming model. Indices were then developed to compare outcomes under the Land Retirement Alternative

Table 3. Factors expressing the amount of income and the amount of employment generated per million dollars output of the major crop commodities by farm production regions.[a]

Region	Income generation factor[b] Wheat	Feedgrains	Oilmeal	Cotton lint	Labor generation factor [b] Wheat	Feed Grains	Oilmeal	Cotton lint
	(million dollars generated per million dollars of output)				(workers required per million dollars of output)			
Northeast	1.3527	1.5491	1.3853	---	227.5079	164.9224	226.1004	----
Corn Belt	1.3030	1.4994	1.2372	2.0594	167.8486	160.2275	144.0536	313.9233
Lake States	1.3494	1.4957	1.2769	---	188.5745	172.2950	163.3703	----
Appalachian	1.3223	1.4541	1.3241	1.8456	258.6585	260.3298	194.8599	412.0765
Southeast	1.2364	1.4013	1.1962	1.8735	216.0622	244.2514	154.8661	350.9728
Delta States	1.0074	1.4608	1.2200	2.0867	135.2166	279.1244	151.6656	321.8187
Southern Plains	1.1074	1.5184	1.2085	1.9620	141.8527	196.0828	140.8949	303.9329
Northern Plains	1.2480	1.4379	1.2688	---	158.6989	176.9393	158.7830	----
Mountain	1.2568	1.4629	1.3146	1.9413	163.0581	196.8004	162.4116	210.9300
Pacific	1.0443	1.4935	1.3146	2.1632	110.2081	167.5338	162.4116	198.6634

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[a] See Appendix B for discussion of methods used to calculate these values.

[b] The basic coefficients used in developing these secondary impact factors are reported by Schluter (Schluter, G.E.; "An Estimation of Agricultural Employment Through an Input-Output Study" unpublished Ph.D. dissertation. Iowa State University, 1971).

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with those for the other three policy alternatives. These indices indicate how income and employment would be affected by each of the farm program alternatives. As mentioned previously, the amount of employment generated refers to the number of workers required not only in agriculture, but also in agriculturally-related sectors of the rural areas and regions for which the data are summarized. Similarly, the amount of income generated includes not only income in agriculture but also income in other sectors of rural areas or regions for which data are summarized.

To calculate these indices, the projected value of the income and employment generation variables was computed for each of the four policy alternatives. For each region or rural area, these values were then divided by the estimated values of the Land Retirement Alternative and multiplied times 100. Therefore, the results of each policy alternative can be expressed in terms of percentage change from the Land Retirement Alternative results. For example, an index value of 250 for the amount of income generated under Bargaining Power Alternative A means that the amount of income generated by the production of the crops endogenous to this study would be 2.5 times what it would be under the Land Retirement Alternative.[1] This does not imply that the total income in a region will be 2.5 times greater under Bargaining Power Alternative A than under the Land Retirement Alternative. The degree to which the total income of any region is affected by changes in government farm policies depends upon the relative contribution of the endogenous crops to the total income generated in that region.

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[1] The crops endogenous to this study are wheat, feedgrains, soybeans, and cotton.

The same meaning is applicable to the indices relating to the amount of employment generated.

The income and employment generation factors are assumed constant for all policy alternatives included in this study. In other words, for the commodities studied, the mix of items purchased per dollar of output is assumed to remain constant for all policy alternatives. In actuality, the mix of items purchased would change as the price of commodities varied. Linking the income and employment generation factors, directly to the value of output as done in this study, therefore, does not reflect "real-world" conditions. Ideally, the secondary impact factors should be recalculated for each policy alternative to reflect changes in the mix of items purchased as the farmer's income position changes. However, this could not be accomplished because of the unavailability of the required data. Therefore, we would caution the reader of the limitations of this method used in the study and would stress the need for additional data relating to expenditure patterns in rural America.

IV. PARAMETERS USED

Use of the linear programming model to determine the production impacts of the alternative commercial farm policies requires that the values of a large number of parameters be estimated. These parameters include capital and labor coefficients for each crop in each rural area, per capita consumption for different foods in the various market regions, transportation costs for each commodity between each pair of regions and related data on land restraints and yields in each rural area. Details on these parameters and their calculation are not reported here but can be obtained from the authors. The cropland base for each producing area is held constant at the 1965 level. Carry-over stocks for major commodities are considered to be the same for the four policy alternatives. Population, per capita disposable income, and yield coefficients for the major crop commodities are projected to 1975. Hence, all results of the study refer to 1975.

Prices

Prices received by farmers either (a) had to be prescribed for each model, with the analysis designed to provide this level of prices, or (b) were generated by the results of the model. In the case of the Bargaining Power Alternatives, the price levels were established beforehand as a goal of the program, then the degree of supply restraint necessary to generate these price levels was incorporated in the model. In the case of Free Market and Land Retirement Alternatives, the prices were not prescribed, but were generated by the model. Farm prices for the four alternative farm policies are presented in Table 4. Prices for the Free Market Alternative

Table 4. Farm prices for the major farm commodities under the four policy alternatives in 1975, with 1969 prices for comparison.

Item	Unit	1969[a] Prices	1975 Estimated prices[b]			
			Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Crop Prices						
Wheat	dol./bu.	1.24	1.39	1.72	2.05	2.60
Feedgrains corn equivalent	dol./bu.	1.16	1.12	1.42	1.75	2.10
Soybeans	dol./bu.	2.35	2.46	2.84	3.85	4.45
Cotton	cents/lb.	21.0	25.0	26.0	35.0	40.0
Livestock Prices						
Cattle and calves	cents/lb.	26.2	26.0	31.0	35.0	41.0
Hogs	cents/lb.	22.2	19.0	25.0	32.0	39.0
Broilers	cents/lb.	15.2	15.0	20.5	26.0	33.0
Lambs	cents/lb.	27.2	24.0	28.0	33.0	41.0

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[a] Source: Demand and Price Situation, USDA ERS, November 1971.

[b] All prices for 1975 are measured in 1970 equivalent dollars and do not take into account inflation from 1970 to 1975.

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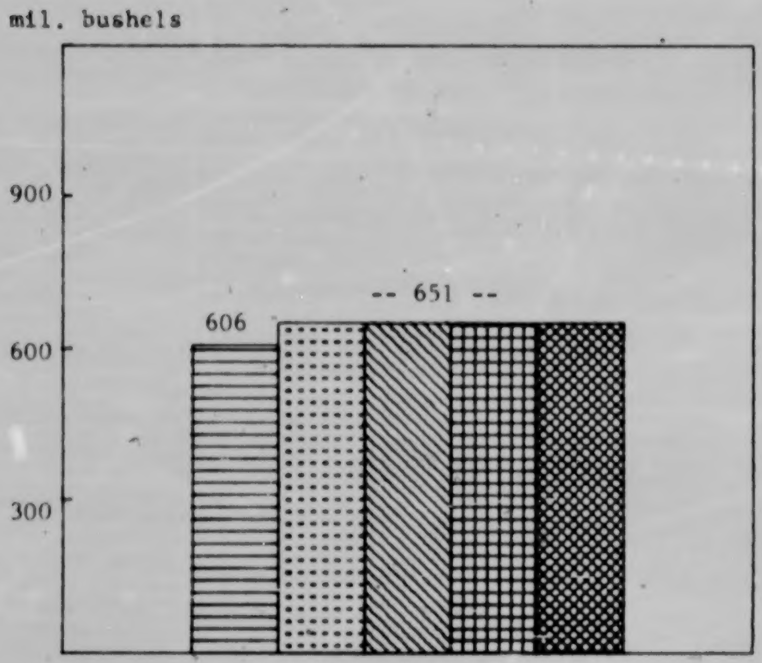
generally are similar to the prices actually received by farmers in 1969. However, for swine and lamb, actual 1969 prices were nearer the higher prices estimated for the Land Retirement Alternative. The projected price levels in both of the Bargaining Power Alternatives are higher than the actual 1969 prices and in both cases are higher than for the Free Market or Land Retirement Alternatives. The farm prices presented in Table 4 are calculated in 1970 constant dollars. Therefore these prices would be 10 percent higher in current prices due to inflation from 1970 to the present.

Export Levels

In 1969, eighteen percent of the total harvested acreage of crops produced commodities that were exported. Hence, export levels for each of the policy alternatives had to be estimated as a component of total demand. The quantities of the major crop commodities exported in 1969 as well as projected export levels for 1975 are presented in Figures 4-7.

In the past wheat exports have been regulated to a large extent by international trade agreements. Therefore, the same level of wheat exports is used for all four policy alternatives. However, the quantity of feedgrains exported varies inversely with the price level for the four policy alternatives. The greatest quantity of exports (25 million tons, corn equivalent) is projected for the Free Market Alternative. This alternative would have the lowest feedgrains price of the four policies considered. The quantity of feedgrains actually exported in 1969 is nearly equal to the projected 20.5 million tons (corn equivalent) of feedgrains exports projected under the Land Retirement Alternative.

Because of the upward trend in soybean exports, oilmeal exports greater



a/ Source: Wheat Situation, USDA, ERS, May 1972.

Figure 4. Estimated wheat exports for each of the policy alternatives in 1975 with 1969 exports for comparison.[a]

Key:

- ▤ Actual 1969
- ░ Free Market Alternative
- ▧ Land Retirement Alternative
- ▦ Bargaining Power Alternative A
- ▩ Bargaining Power Alternative B

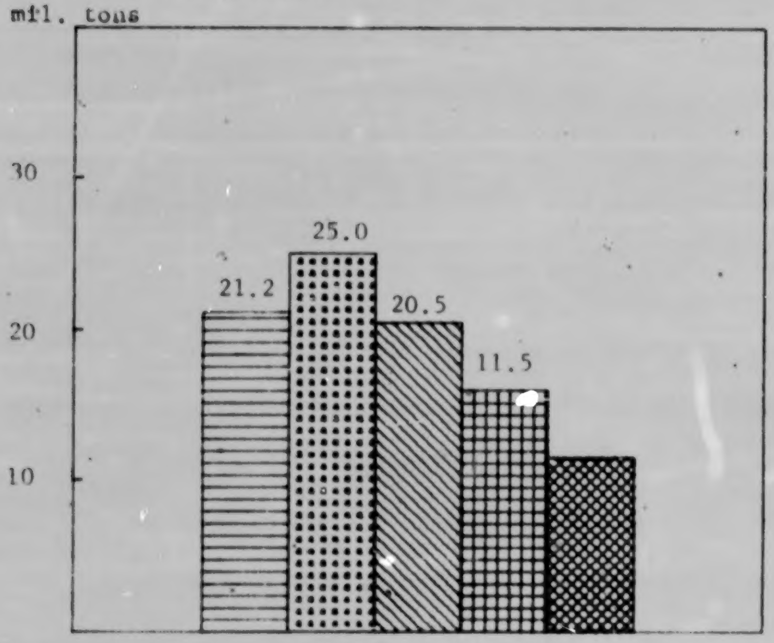
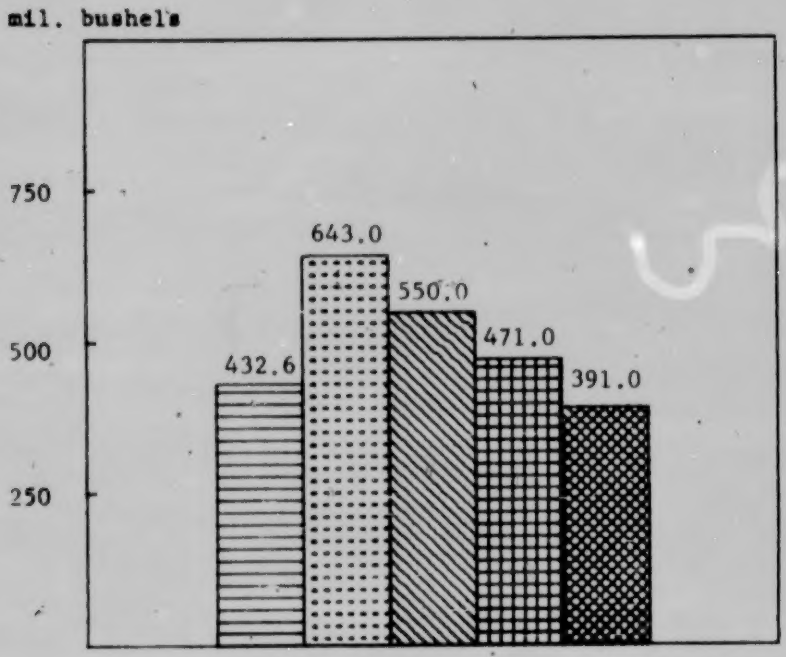


Figure 5. Estimated exports of feed grains for each policy alternative with 1969 actual exports for comparison.

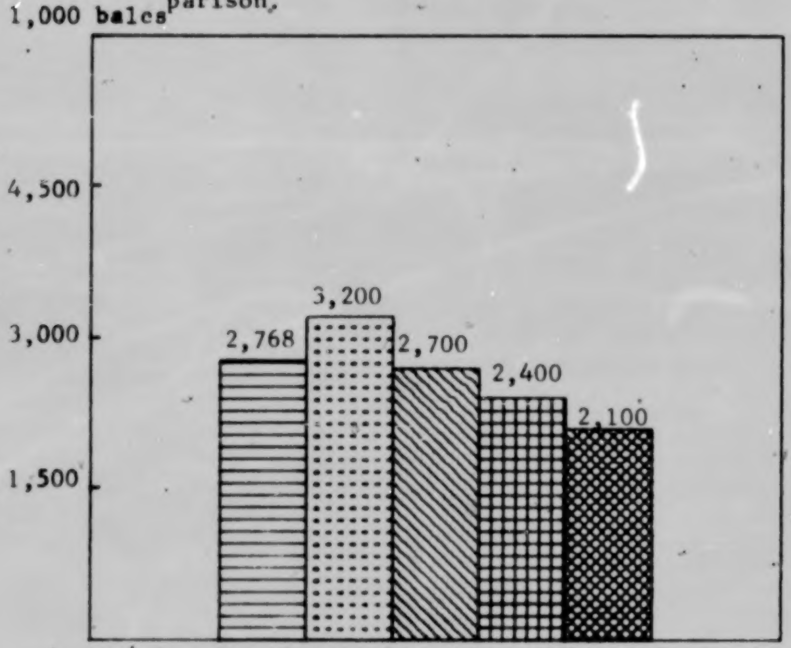


a/ Source: Fats and Oils Situation, USDA, ERS, April 1972.

Figure 6. Estimated soybeans exports for each of the policy alternatives in 1975 with 1969 exports for comparison.

Key:

- ▤ Actual 1969
- ⠿ Free Market Alternative
- ▧ Land Retirement Alternative
- ▦ Bargaining Power Alternative A
- ▩ Bargaining Power Alternative B



a/ Source: Cotton Situation, USDA, ERS, April 1972.

Figure 7. Estimated cotton lint exports for each of the policy alternatives with 1969 exports for comparison.[a]

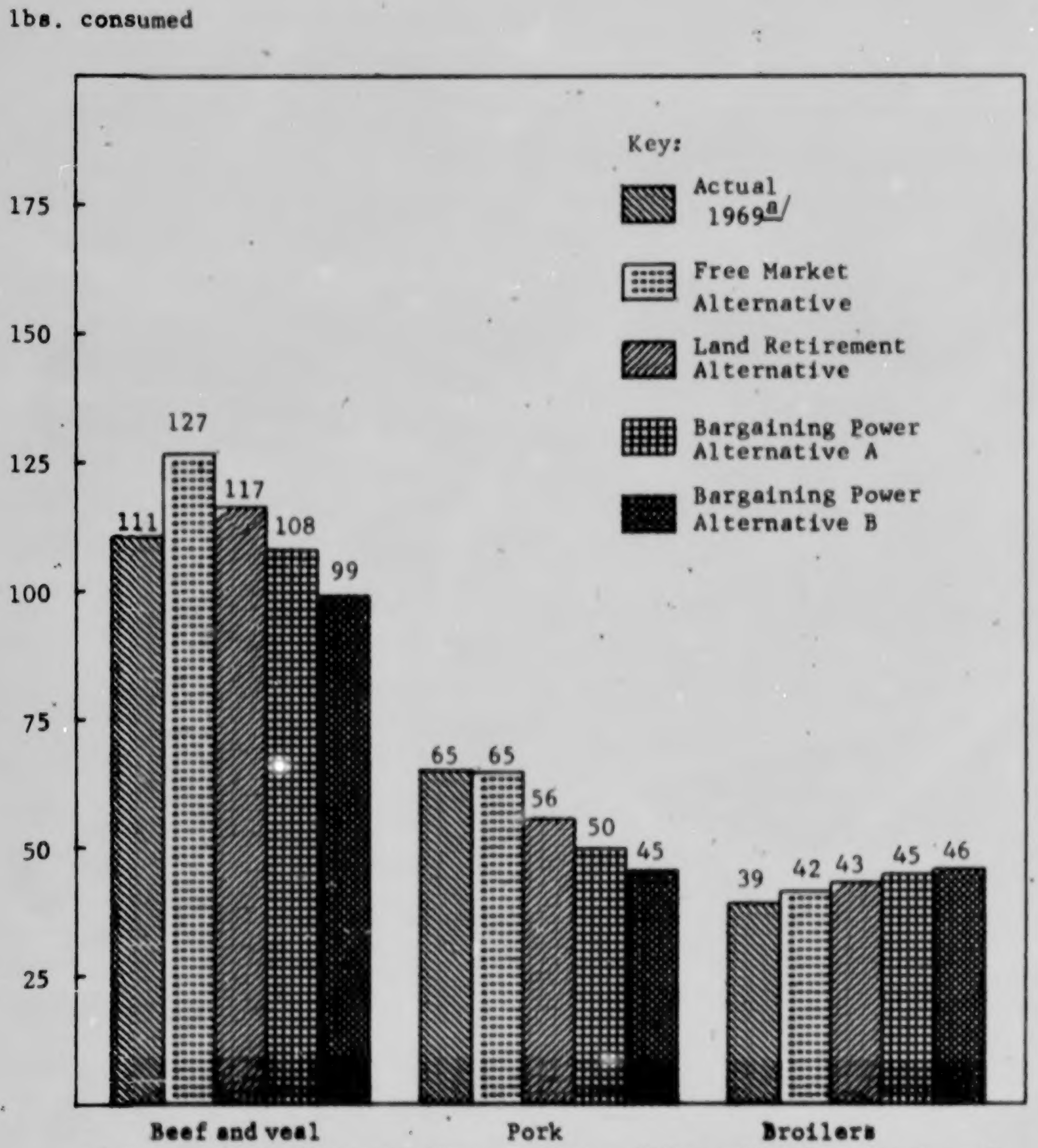
than the actual 1969 amount are projected for all policy alternatives except Bargaining Power Alternative B. The highest cotton exports are projected for the Free Market Alternative and the lowest for Bargaining Power Alternative B. The 1969 actual export levels approximate those projected for the Land Retirement Alternative.

The export estimates defined for this study are consistent with U.S. crop export levels of the late 1960's. These export levels may be underestimated, however, because of recent events which have occurred. Crop failures in some of the large wheat producing nations and a sharp cutback in Peruvian fishmeal production drastically altered the world food supply situation for 1972. The devaluation of the American dollar also has lessened the real cost of U.S. farm products to foreign buyers. Consequently, absolute levels of production and farm commodity prices determined in this study should be evaluated with these world market changes in mind. But even with the higher export levels, the results between the different policy alternatives should maintain a similar, relative position.

Per Capita Consumption of Meat

The per capita consumption of the major livestock commodities also was estimated to determine the feed demand for feedgrains and oilmeals. Per capita quantities at each price level are based on existing estimates of the price elasticity of demand and projected income. These estimated quantities for each of the policy alternatives and the 1969 actual per capita consumption of these commodities are presented in Figure 8.

Reflecting the growing consumer preference for beef, the estimated quantity of beef and veal is lower than in 1969 only for the higher price



a/ Source: Food Consumption, Prices and Expenditures, Supplement for 1970, USDA, ERS, November 1971.

Figure 8. Per capita consumption of meats projected to 1975 for each of the policy alternatives and 1969 actual consumption for comparison.

levels of the Bargaining Power Alternatives. Per capita consumption of broilers is greater in all of the policy solutions than in 1969 due to its low price relative to pork, beef and lamb.

V. SECONDARY EFFECTS IN RURAL AREAS

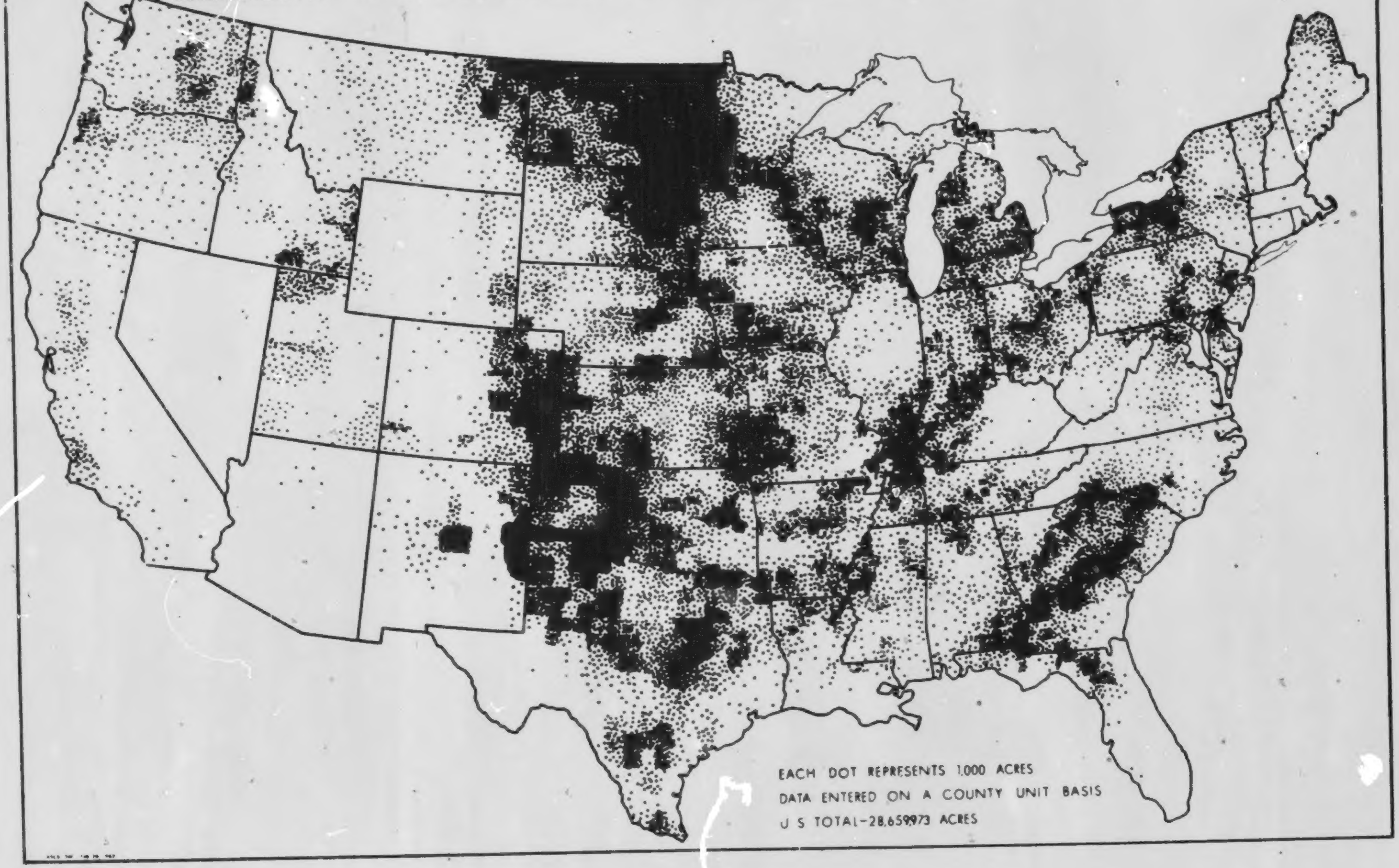
A major purpose of this study is to measure the impact of alternative farm policies on employment and income in rural areas. Many rural communities lack natural endowments, historic economic development, and other attributes that attract industry. Hence, the welfare of their nonfarm population will especially depend on the structure and income of farming as these variables are reflected throughout the community in generating off-farm income and employment. How do different alternatives in farm programs affect income and employment elsewhere in the rural community?

The level of farm income generated at regional, state, and national levels is only one of the outcomes or variables affected by farm programs. The pattern of agricultural production and the level of farm income related to a particular farm program affect the employment and income of other groups in rural communities who are associated with supplying inputs and processing outputs of agriculture. In other words, production of farm crops generates economic activity beyond that involved directly in the planting and harvesting of crops. This added or related economic activity would be reflected in the industries that manufacture and distribute farm inputs such as implements, fertilizers, insecticides, seeds, feeds, and other items. It also is reflected in the businesses of rural areas which handle and process agricultural products and in those which develop to service agriculture and other closely related groups in the community through the supply of consumer goods, financial and other services.

Different farm programs can have entirely different impacts in different farming areas of the nation. For example, the early land retirement programs of the 1950's, represented by the "soil bank" or "conservation reserve," allowed land withdrawal to be concentrated by farming areas. On a semi-bid basis, farmers were able to select whether or not to idle their land in terms of its productivity and payment rates available. In general, this program caused land retirement to be concentrated in areas where soil productivity and yields were low relative to payment rates (see Figure 9). Because land retirement tended to be concentrated in certain regions of the Great Plains, Southeast and southern Corn Belt, it greatly reduced farmers purchases of production materials. Also, since farmers could put their entire farm in the soil bank and still receive payments, many moved out of the community to take employment at another location. Consequently, their purchases of consumer goods and agriculturally-related services in the original community also ceased.

This reduction in the volume of business in rural communities where land retirement became concentrated caused vigorous protests by rural business leaders. Their pressure on Congressmen eventually caused land retirement programs to be reshaped in a manner that did not concentrate idle land by specific regions.

This section indicates how the employment and income generated in rural communities and agriculturally-related industries, as well as in agriculture, would be affected by the four farm programs analyzed. Income and employment generated outside of agriculture would be affected by both (a) the acreages of crops and levels of production, and (b) the level of farm income, associated with a particular type of farm policy. The crop acreage and pattern of production would have direct effects especially in



CONSERVATION RESERVE PROGRAM ACREAGE UNDER CONTRACT AS OF JULY 15, 1960

EACH DOT REPRESENTS 1,000 ACRES
DATA ENTERED ON A COUNTY UNIT BASIS
U S TOTAL–28,659,973 ACRES

Figure 9.

the amount of production materials used. If the farm policy causes a reduction in crop acreage and production, it also would reduce the amount of tractor fuel, fertilizer, seed, repairs and equipment moving from processing plants and through the service sector of the rural community. Reduction of farm income in a rural area would directly affect the amount of consumers' goods purchased by farm families. But these reductions in both producers and consumers' goods also would have indirect or secondary effects in the rural community business sector. As the fertilizer distributor's volume and income is reduced, his demand for consumer goods and financial services also would decline. As the volume and income of the retailer falls off, he may postpone or eliminate store improvements, thus reducing demand for the products of the local lumberyard or machine shop.

Effects of the Policy Alternatives on Income Generated

This section compares the income generation effects of the Land Retirement Alternative with those of the other three policy alternatives.

National effects

To allow a direct comparison of how the four program alternatives affect the amount of income generated in rural areas and agriculturally-related industries, the estimate of the amount of the income generated under each program has been converted to an index value.[1] The level of income associated with the Land Retirement Alternative is used as a benchmark and has been set at 100. The results for the other programs are expressed accordingly (as explained earlier in the manuscript). These indices for each of the four policy alternatives are presented in Table 5 for the United States and for the 10 farm production regions.

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[1] The income generation variable used in the study is defined as follows: the amount by which the total income in the United States economy will increase because of the production of an additional $1 million worth of output in a particular sector.

The figures in Table 5 indicate that the type of farm program can have a very great effect on the amount of income generated in rural areas and agriculturally-related industries. It is true, of course, that if the funds and resources required to support and implement a particular type of program were used elsewhere in the economy, income and employment also would be generated in these other sectors and locations---as a national offset of farm programs in rural communities and agriculturally-related industries. However, the same can be said of a rural industry. If it were not located in the rural community it could be located in an urban center where it would generate income and employment. Since an emerging goal of the nation is that of rural community development and a greater spatial dispersion of economic activity and employment, the effects of different farm programs are interesting and important in these respects.

Free Market Alternative

For the nation as a whole, production of the crops included in this study would generate about 14 percent less income under the Free Market Alternative than under the base alternative (the Land Retirement Alternative). The smaller income index value for the Free Market Alternative results because of the lower farm income associated with this policy alternative. Income generated under the Free Market Alternative is less than under the Land Retirement Alternative for all production regions except the Southern Plains region. Under the Free Market Alternative, this region would have

Table 5. Indices comparing the amount of income generated under the Land Retirement Alternative with the amount of income generated under each of the other policy alternatives for the United States and for the ten production regions.

Region	1975 Estimated index values			
	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
United States	86	100	119	130
Northeast	29	100	131	142
Corn Belt	90	100	125	136
Lake States	90	100	121	131
Appalachian	79	100	132	147
Southeast	63	100	124	130
Delta States	58	100	123	144
Southern Plains	126	100	105	110
Northern Plains	79	100	109	124
Mountain	66	100	120	128
Pacific	60	100	118	123

an increased acreage of wheat and cotton to take fullest advantage of its soil and water resources.[1] To supply its growing fed cattle industry which is favored by this location, population growth and market environment, feedgrains would be transported to it from other regions and more wheat would be used for feed in the Southern Plains region itself. The Corn Belt and Lake States regions have levels of income generated under the Free Market Alternative that are only 10 percent less than under the base alternative. However, considerable differences would exist within these regions. Some rural areas in the Corn Belt and Lake States regions would have higher levels under the Free Market Alternative because market forces concentrate grain production in the areas of favorable yields and comparative advantage. Other rural areas of the region would have a lower income index under the Free Market Alternative because a national allocation of crops relative to comparative advantage, reflected in natural and market conditions, would cause them to shift out of grain production and into less intensive land uses such as grazing. These differences are detailed in a later section dealing with economic impacts of programs in the North Central Region.

Overall, even though some rural areas would suffer very adverse outcomes under the Free Market Alternative, the Corn Belt and Lake States regions would fare much better than most other regions because a greater proportion of the nation's agricultural production would be concentrated in the central United States. Under the Free Market Alternative, crop acreage in the Southern Plains, Corn Belt and Lake States regions is 20 percent greater than under the Land Retirement Alternative. While cropland in these regions also would be shifted from annual crops under the Free Market Alternative, the shift would tend to concentrate in regions of lowest comparative advantage. Under the Land Retirement Alternative, land held from production through the inducement of government payments to farmers would be scattered throughout all regions on a partial farm basis. It thus tends to hold labor and equipment on the farm as a means of operating the remainder of the unit. Under the Free Market Alternative, entire farms would be shifted from annual crop production and the need for the equipment to handle them would be eliminated. Also, less intensive land use would release labor as farms were consolidated to allow competitive incomes under lower farm prices and the absence of direct payments to farmers. The three regions mentioned previously would increase their crop acreage by a percentage twice as great as for the nation as a whole under the Free Market Alternative. The national crop acreage under the Free Market Alternative is projected to increase by 10 percent over the base alternative in the absence of land retirement mechanisms.

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[1] Appendix Tables E.1, E.2, E.3 and E.4 present the regional distribution of cropland used for wheat, feedgrains, soybeans and cotton production under each of the policy alternatives with the 1969 actual values for comparison. Appendix Table E.5 presents the regional distribution of total cropland used for the crops endogenous to this study with the 1969 actual values for comparison.

The Appalachian, Mountain, and Pacific regions would all have a greater acreage devoted to crops under the Free Market Alternative, but all would have a lower index of income generated than under the Land Retirement Alternative. The Northeast, Southeast, Northern Plains, and Delta States would have both a smaller crop acreage and a reduction in income generated under the Free Market Alternative. Compared to the Land Retirement Alternative, the reduction in income generated for rural areas and agriculturally-related industries would be severe in these regions.

Bargaining Power Alternative A

In contrast, the higher farm income and the spatial distribution of supply restraints associated with the Bargaining Power Alternatives have a large effect in boosting the amount of income generated by production of the endogenous crops in the United States and most of the major producing regions. The index of income generation under Bargaining Power Alternative A is 19 percent higher than under the Land Retirement Alternative and 138 percent higher than under the Free Market Alternative. Extreme differences prevail for the Northeast region, where income generated under Bargaining Power Alternative A is 31 percent greater than under the Land Retirement Alternative and 448 percent greater than under the Free Market Alternative. Since the Bargaining Power Alternatives do not include payments to farmers as a means of reducing supply, Bargaining Power Alternative A provides only modest gains in the amount of income generated throughout rural areas and agriculturally-related industries for the Southern Plains, Pacific, and Northern Plains regions. In income generation, only the Southern Plains would be better off under the Free Market Alternative than under Bargaining Power Alternative A. The Southern Plains region would have a much larger cotton acreage under the Free Market Alternative than under either the Land Retirement Alternative or Bargaining Power Alternative A. Cotton acreage in this region is 55 percent smaller under the latter alternative than under the Free Market Alternative.

Bargaining Power Alternative B

Compared with the Land Retirement Alternative, Bargaining Power Alternative B would bring large increases in the amount of income generated for all regions of the United States because of the higher farm prices of this policy alternative. Under Bargaining Power Alternative B the amount of income generated in the Northeast, Appalachian, and Delta States regions increases by more than 40 percent over the amount of income generated in these regions under the Land Retirement Alternative. Compared to the Land Retirement Alternative, the Northeast region increases its production of feedgrains while the Appalachian and Delta States regions increase their production of cotton under Bargaining Power Alternative B. All of the farm production regions except the Southern Plains region would have their highest level of income generation under Bargaining Power Alternative B. Under this policy alternative, cotton acreage in the Southern Plains region would be 61 percent less than it is in the Free Market Alternative.

Rural area effects

Each of the 10 farm production regions we have been discussing is comprised of several rural areas. The effect of a policy alternative upon some of the rural areas within a farm production region may be significantly different than the effect of that policy alternative on the farm production region as a whole. For example, a policy alternative that would increase the amount of income generated in a farm production region may cause the amount of income generated to increase in some rural areas, decrease in others, and remain constant in other rural areas. The following discussion will highlight those rural areas that experience income generation effects significantly different than those reported for the entire farm production region. For all of the policy alternatives, Appendix Table D.1 presents the indices of income generated for each of the 40 states that have cropland that can be used for production in the programming model, and Appendix Table D.2 presents the indices of income generated for each of the 150 rural areas used in this study. All of the index values referred to in this discussion can be found in these appendix tables. In this section we will present only a general discussion of the income generation effects that would occur in the rural areas of the North Central Region. A more detailed analysis for those rural areas is presented in the section dealing exclusively with the North Central Region.

Free Market Alternative

Under the Free Market Alternative, the income generated in the entire Northeast region would decrease by 70 percent from its level under the Land Retirement Alternative. However, in western New York, the income generated under the Free Market Alternative would be 34 percent higher than under the Land Retirement Alternative (see rural area 1). When the production restraints associated with the Land Retirement Alternative are withdrawn, this rural area would concentrate on wheat production which would result in an increase in the amount of income generated under the Free Market Alternative for this rural area. The acreage devoted to wheat in this rural area would increase by 65 percent under the Free Market Alternative. In the Appalachian region as a whole, the income generated under the Free Market Alternative is 20 percent lower than under the Land Retirement Alternative. However, in eastern North Carolina and western Kentucky, the amount of income generated under the Free Market Alternative is much higher than under the Land Retirement Alternative because of increases in crop production in these rural areas (see rural areas 7, 10, 33, 34, 35, 41).

In western Kentucky the acreage in crops increases by 50 percent under the Free Market Alternative while in eastern North Carolina the acreage in crops under this policy alternative is 35 percent greater than under the Land Retirement Alternative.

Under the Free Market Alternative the production of feedgrains in southern Georgia increases by almost 40 percent from its level under the Land Retirement Alternative (see rural areas 13, 14). This increase in production causes the income generated by these rural areas to be greater under the Free Market Alternative than under the Land Retirement Alternative. Similarly, in western Louisiana, a threefold increase in the production of cotton causes the income generated in this area to be 176 percent larger under the Free Market Alternative than under the Land Retirement Alternative (see rural area 120).

The Southern Plains region is the only farm production region for which the amount of income generated under the Free Market Alternative is greater than it would be under the Land Retirement Alternative. However, this increase in income generation is not distributed evenly throughout the Southern Plains region. Of the 23 rural areas in this region, only eight of them would have higher levels of income generation under the Free Market Alternative than under the Land Retirement Alternative (see rural areas 111, 112, 114, 115, 116, 122, 124, 126). These rural areas are located in southwestern Oklahoma, northwestern Texas, and south-central Texas and would experience sizeable increases in the number of acres devoted to the production of cotton under the Free Market Alternative. This implies that although the merchants and rural citizens in these eight rural areas would benefit from a shift from the Land Retirement Alternative to the Free Market Alternative, the citizens in the remaining 15 rural areas of this region would be adversely affected under the Free Market Alternative.

Without the land diversion restraints associated with the base solution, the production of feedgrains in the Mountain region could shift from rural areas with primarily dryland production methods to rural areas where irrigation can be used to best advantage. Therefore, while the income generated in the Mountain region as a whole decreases by 34 percent under the Free Market Alternative, the income generated in three of the rural areas of this region would increase under this policy alternative. Under the Free Market Alternative the production of feedgrains is twice as large as it would be under the Land Retirement Alternative in eastern New Mexico, east-central Colorado, and northeastern Colorado (see rural areas 129, 132, 134).

In central California and central Washington, the income generated under the Free Market Alternative would be significantly less than it would be under the Land Retirement Alternative (see rural areas 144, 150). Both of these rural areas would concentrate on wheat production under the Free Market Alternative rather than on the production of feedgrains and cotton which they would be primarily dependent on under the Land Retirement Alternative. This shift in the commodity mix in these rural areas causes an 81 percent decrease in the amount of income generated in central California and a 53 percent decrease in the amount of income generated in central Washington under the Free Market Alternative. However, in southern California the production of cotton under the Free Market Alternative is three times as large as it would be under the Land Retirement Alternative (see rural area 143). Therefore, the income generated in this rural area increases by 119 percent under the Free Market Alternative as compared to the base alternative.

While the Corn Belt region as a whole suffers a 10 percent decrease in the amount of income generated under the Free Market Alternative, the rural areas in southern Ohio and central Indiana have more income generated under this alternative than they do under the Land Retirement Alternative (see rural areas 36, 37, 40, 43). These rural areas are allowed to concentrate on the production of feedgrains under the Free Market Alternative which would cause the amount of income generated to increase under this policy alternative. In the northern and western sections of the North Central Region, the amount of income generated under the Free Market Alternative is much less than it would be under the Land Retirement Alternative as there are considerably fewer acres of cropland in production under the former solution than under the latter (see section on North Central Region).

Under the Free Market Alternative production of each of the crops included in our model is concentrated in those rural areas that are best suited for the production of these crops. Thus it was possible that the demands associated with this policy alternative could be satisfied even though some rural areas would not produce any of the crops endogenous to this study under the Free Market Alternative. Therefore, our analysis shows that the amount of income generated by the production of these crops would fall to zero under the Free Market Alternative. Perfect mobility of resources is assumed among the 150 rural areas in the programming model.

This assumption allows drastic shifts in location and amounts of production under the Free Market Alternative. In actuality, resources (e.g., capital and labor) would possess some immobility resulting in smaller shifts and changes than indicated by this policy alternative. Even with perfect mobility of resources, however, total income in an area or region would not fall to zero, since the commodities studied do not generate the entire income of any area or region. Rural areas in which the amount of income generated is at or near the zero level under the Free Market Alternative are in eastern Pennsylvania, southwestern Missouri, northern Wisconsin, central Minnesota, eastern Virginia, western North Carolina, central Tennessee, central Alabama, central Texas, the western areas of the Dakotas, southeastern Montana, eastern Wyoming, east-central Colorado, and southern Arizona (see rural areas 2, 64, 47, 78, 5, 6, 16, 28, 22, 23, 121, 123, 128, 82, 83, 85, 86, 136, 135, 131, 142).

Bargaining Power Alternative A

Under Bargaining Power Alternative A, the income generated in the Appalachian and Southeast regions is greater than it would be under the Land Retirement Alternative. The amount of income generated in the Appalachian region increases by 32 percent while in the Southeast region it increases by 24 percent. However, some of the rural areas in these regions would experience decreases in the amount of income generated under Bargaining Power Alternative A (see rural areas 9, 16, 17, 18, 21, 22, 23, 24, 26). These rural areas are located in western North and South Carolina, northern Georgia and central Alabama, and as a group would have over 50 percent fewer acres in crops under Bargaining Power Alternative A than under the

Land Retirement Alternative. This decrease in production is due to the lower demands associated with Bargaining Power Alternative A which can be satisfied in rural areas that possess either higher quality land or more advantageous transportation factors. This shift in relative production means that the higher farm commodity prices associated with Bargaining Power Alternative A would not benefit farmers and other rural citizens in these rural areas (when compared to the base alternative).

In the Delta States region as a whole, the amount of income generated under Bargaining Power Alternative A is 23 percent greater than it would be under the Land Retirement Alternative. However, in western Louisiana and southern Arkansas the income generated under Bargaining Power Alternative A is slightly less than it would be under the base alternative (see rural areas 59, 120). And in north-central Louisiana there would be 40 percent less income generated under Bargaining Power Alternative A (see rural area 58). This sizeable decrease in the amount of income generated would be the result of a major reduction in the amount of cropland used in this rural area under Bargaining Power Alternative A. Under this policy alternative there would be 70 percent fewer acres in production than under the Land Retirement Alternative in this rural area.

Under Bargaining Power Alternative A the amount of income generated in the Southern Plains region would be only four percent greater than under the Land Retirement Alternative and would be 17 percent less than it would be under the Free Market Alternative. However, the income generated under Bargaining Power Alternative A is distributed much more evenly throughout the Southern Plains region than under the Free Market Alternative. Under Bargaining Power Alternative A, 15 of the region's 23 rural areas would have increases in the amount of income generated as compared to base alternative. The rural areas that would not have increases in income generated under Bargaining Power Alternative A are located in southern Oklahoma, east-central Texas and southwestern Texas (see rural areas 105, 110, 111, 115, 118, 119, 121, 127). Under this policy alternative these eight rural areas would have 25 percent fewer cropland acres in production than under the Land Retirement Alternative.

The Mountain region would have 20 percent more income generated under Bargaining Power Alternative A than under the Land Retirement Alternative. This increase in the amount of income generated occurs throughout the region as only one of its rural area would have a sizeable decrease in the amount of income generated under Bargaining Power Alternative A (see rural area 132). While this rural area concentrates on the production of feedgrains under both policy alternatives, 30 percent fewer acres would be in production under Bargaining Power Alternative A resulting in a 15 percent decrease in the amount of income generated in this rural area.

In the Pacific region, only rural area 143 in southeastern California would have a marked decrease in the amount of income generated under Bargaining Power Alternative A. This rural area maintains almost the same level of cotton production under Bargaining Power Alternative A as it did under the Land Retirement Alternative. However, the production of wheat, which accounts for two-thirds of this area's cropland acreage under the Land Retirement Alternative, shifts almost entirely out of this rural area under Bargaining Power Alternative A. Due to this drastic reduction in wheat production, the income generated in this rural area under Bargaining

Power Alternative A would be 20 percent less than under the Land Retirement Alternative.

Under Bargaining Power Alternative A, the increase in the amount of income generated in the Corn Belt and Lake States regions would be distributed throughout the rural areas of these two regions. Only in southern Ohio does the amount of income generated under Bargaining Power Alternative A decrease by more than 10 percent from what it would be under the Land Retirement Alternative (see rural areas 36, 37). However, in the Northern Plains region, rural areas in southwestern North Dakota, central South Dakota and southwestern Kansas would experience significant decreases in the number of acres in production and in the amount of income generated under Bargaining Power Alternative A (see rural areas 83, 86, 88, 104). Rural area 83 in southwestern South Dakota is the only rural area in the model which wouldn't have any production of the crops endogenous to this study under Bargaining Power Alternative A. Therefore, the amount of income generated in this rural area would fall to zero under Bargaining Power Alternative A.

Bargaining Power Alternative B

Nationally, the amount of income generated under Bargaining Power Alternative B is 30 percent greater than under the Land Retirement Alternative. This increase in the amount of income generated is experienced throughout most of the rural areas delineated for this study. Only 23 of the 150 rural areas would have less income generated under Bargaining Power Alternative B than under the Land Retirement Alternative. These are areas which would have drastic reductions in the amount of farm commodities they would produce under Bargaining Power Alternative B. Therefore, even with the higher farm prices associated with this policy alternative, the amount of income generated in these areas would be less than under the Land Retirement Alternative.

In western North Carolina, northern Georgia and southern Alabama, the amount of income generated under Bargaining Power Alternative B decreases by more than 19 percent from its level under the Land Retirement Alternative (see rural areas 16, 18, 21, 24). Under Bargaining Power Alternative B, 70 percent fewer acres are in production in these rural areas than under the Land Retirement Alternative. While the production of feedgrains and cotton in these areas remains almost constant between the two policy alternatives, the production of soybeans would be 90 percent lower in Bargaining Power Alternative B.

While the income generated throughout the Delta States region is 44 percent greater under Bargaining Power Alternative B than under the Land Retirement Alternative, the amount of income generated in north-central Louisiana under this policy alternative would be 40 percent less than under the Land Retirement Alternative (see rural area 58). The total number of acres in crops in this rural area under Bargaining Power Alternative B decreases by 72 percent from under the Land Retirement Alternative. This decrease in production is concentrated in soybean production which would be 90 percent lower under Bargaining Power Alternative B than under the Land Retirement Alternative.

While the amount of income generated in the Southern Plains region as a whole is only 10 percent greater under Bargaining Power Alternative B than under the Land Retirement Alternative, only four of this region's 23 rural areas would experience sizeable decreases in the amount of income generated under this policy alternative. These four rural areas are located in southeastern Oklahoma and northeastern Texas (see rural areas 110, 115, 118, 119). Under Bargaining Power Alternative B these rural areas would have 64 percent fewer acres in production than under the Land Retirement Alternative. This decrease in cropland acreage would be accompanied by a shift from cotton and soybean production to primarily wheat production under Bargaining Power Alternative B contributing to the decrease in income generated in these four rural areas.

The only rural area in the Pacific region which would have less income generated under Bargaining Power Alternative B than under the Land Retirement Alternative is located in southeastern California (see rural area 143). This rural area, which would have 74 percent fewer acres in production under Bargaining Power Alternative B, would have a 19 percent decrease in the amount of income generated under this policy alternative compared to the Land Retirement Alternative.

In the North Central Region the only rural areas which have less income generated under Bargaining Power Alternative B than under the Land Retirement Alternative are in central South Dakota and southwestern Kansas (see rural areas 88, 104). Rural area 88 in central South Dakota would have 81 percent fewer acres in production under Bargaining Power Alternative B. Rural area 104 in southwestern Kansas shifts from a production pattern dominated by the production of feedgrains under the Land Retirement Alternative to one in which 70 percent of its cropland acres would be used to produce wheat.

Effects of the Policy Alternatives on Employment Generated

This section compares the employment generation effects of the Land Retirement Alternative with these of the other three policy alternatives.

National effects

To show the differential impacts which the four policy alternatives have on the amounts of employment generated in different areas, we have again computed indices that compare the amount of employment generated under the Land Retirement Alternative with the amount of employment generated under each of the other policy alternatives.[1] These indices are presented in Table 6 for the United States and for each of the 10 farm production regions.

Free Market Alternative

Nationally, the amount of employment that is generated by the production of the crops endogenous to this model would be 14 percent less under the Free Market Alternative than under the Land Retirement Alternative. While the quantity produced increases under the Free Market Alternative, the price received by farmers would decrease by a proportionally greater factor. The resulting reduction in the value of farm output would lead to a decrease in net farm income and to a reduction in the amount of employment generated under the Free Market Alternative.

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[1] The employment generation variable used in this study is defined as follows: the number of additional workers required in the United States economy because of the production of an additional $1 million worth of output in a particular sector.

Table 6. Indices comparing the amount of employment generated under the Land Retirement Alternative with the amount of employment generated under each of the other policy alternatives for the United States and for the ten farm production regions.

Region	1975 Estimated index values			
	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
United States	87	100	120	131
Northeast	37	100	123	133
Corn Belt	91	100	127	138
Lake States	90	100	120	130
Appalachian	76	100	132	148
Southeast	61	100	129	136
Delta States	56	100	124	145
Southern Plains	130	100	104	109
Northern Plains	79	100	109	124
Mountain	69	100	120	128
Pacific	62	100	119	125

However, the amount of employment generated in the Southern Plains region increases by 30 percent under the Free Market Alternative. Under this policy alternative the production of cotton would almost double in the Southern Plains region.[1] Since the Labor Generation Factor of cotton is high relative to the other crops, this shift to cotton production induces the increase in employment in this region. However, the Appalachian, Southeast, Delta States, Mountain, and Pacific regions all would experience sizeable reductions in the amount of cotton produced under the Free Market Alternative. This reduction in cotton production contributes substantially to the decrease in the amount of employment generated in these regions under this alternative.

Under the Free Market Alternative the Northeast region would have a 63 percent decrease in the amount of employment generated compared to the base alternative. The amount of cropland in production decreases by 58 percent in this region under the Free Market Alternative. This means that employment in the Northeast region is adversely affected due to two factors. The first is the low farm prices that are associated with the Free Market Alternative and the second is the decrease in production that would occur when acreage restraints are removed. However, the acreage in crops would increase under the Free Market Alternative in the Corn Belt and the Lake

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[1] Appendix Tables E.1, E.2., E.3, and E.4 present the regional distribution of cropland used for wheat, feedgrains, soybeans, and cotton production for each of the policy alternatives with 1969 actual values for comparison. Appendix Table E.5 presents the regional distribution of total cropland used for the crops endogenous to this study for each of the policy alternatives with 1969 actual values for comparison.

States regions. This increase in production partially offsets the low farm prices associated with the Free Market Alternative so that the amount of employment generated under this policy alternative decreases by only 10 percent in these two regions.

Bargaining Power Alternative A

Under Bargaining Power Alternative A, the amount of employment generated in each of the farm production regions is higher than it would be under the Land Retirement Alternative and would be 20 percent higher for the nation as a whole under Bargaining Power Alternative A. In the Appalachian and the Southeast regions cotton production increases by more than 30 percent under Bargaining Power Alternative A. This increase in cotton production contributes to the 32 percent increase in employment generated in the Appalachian region and the 29 percent increase in employment generated in the Southeast region.

The amount of employment generated under Bargaining Power Alternative A increases by only four percent in the Southern Plains region. Under this policy alternative the Southern Plains region would have fewer acres devoted to producing cotton and soybeans and more acres devoted to producing feedgrains and wheat than under the Land Retirement Alternative. While the total number of acres in production would decrease only slightly under Bargaining Power Alternative A, the shift in the production mix under this policy alternative leads to only a slight increase in the amount of employment generated in the Southern Plains region. In the Northern Plains region the number of acres in production would decrease by 11 percent under Bargaining Power Alternative A compared to the base alternative. However, the acreage devoted to feedgrains under this policy alternative is only slightly less than under the Land Retirement Alternative. Since in this region feedgrains have the highest Labor generation factor, the maintenance of feedgrains production coupled with the higher prices of Bargaining Power Alternative A would induce a nine percent increase in the amount of employment generated in the Northern Plains region.

Bargaining Power Alternative B

Nationally the amount of employment generated by the production of the crops endogenous to this study would increase by 31 percent under Bargaining Power Alternative B. While the total number of acres in production under Bargaining Power Alternative B would be 12 percent fewer than under the Land Retirement Alternative, the higher prices associated with Bargaining Power Alternative B more than offsets this decrease in production. A sizeable increase in the amount of employment generated would result for all but the Southern Plains region. The Southern Plains region has only a 19 percent increase in employment under Bargaining Power Alternative B. This relatively small increase in employment would be due to a 28 percent decrease in cotton production and an 85 percent decrease in soybean production in the Southern Plains region under this policy alternative.

Rural area effects

Since both the income and employment variables are related to the value of output of the endogenous crops under each of the policy alternatives, their index values in any region or rural area vary in the same direction as the income index values would when they are compared to the Land Retirement Alternative. Because we have previously presented a detailed description of the income effects of the alternative farm policies on rural areas, we will now present only a general discussion of the employment effects that the alternative policies can have on individual rural areas. However, Appendix Table D.3 presents the indices of employment generated for each of the 40 states that have cropland that can be used for production in the programming model and Appendix Table D.4 presents the indices of employment generated for each of the 150 rural areas used in the study. Additional comments detailing the employment effects of the alternative policies upon the North Central Region can be found in the section dealing exclusively with this region.

Free Market Alternative

The decrease in the amount of employment generated under the Free Market Alternative noted at the national level would occur widely throughout the rural areas of the nation. Only those rural areas that have large increases in crop production would have significant gains in the amount of employment generated under the Free Market Alternative.

In western New York and northwestern Nebraska wheat production almost doubles under the Free Market Alternative which would cause the increased employment generation of these rural areas (see rural areas 1, 91). Because of increases in the dryland production of feedgrains, the amount of employment would rise in southern Ohio and Indiana, western Kentucky, eastern North Carolina and southeastern Georgia (see rural areas 36, 37, 43, 40, 33, 34, 35, 41, 7, 10, 13). The irrigated production of feedgrains would increase in eastern New Mexico, east-central Colorado and northeastern Colorado inducing the greater amounts of employment generated in these rural areas under the Free Market Alternative (see rural areas 129, 132, 134). Cotton production, which has a large labor generation factor would increase in west-central Louisiana, southwestern Texas, northwestern and south-central Texas, and southeastern California (see rural areas 120,111, 112, 114, 115, 116, 122, 124, 143). This increased cotton production leads to the large increases in the amount of employment generated under the Free Market Alternative in these rural areas relative to the base alternative.

In contrast to those rural areas which would have gains in the amount of employment generated under the Free Market Alternative, there are numerous rural areas that would not produce any of the endogenous crops under this policy alternative. In rural areas where this occurs, the estimated amount of employment generated by the crops endogenous to this study falls to zero. Rural areas in which the amount of employment generated is estimated at or near the zero level under the Free Market Alternative are in eastern Pennsylvania, southwestern Missouri, northern Wisconsin, central Minnesota, eastern Virginia, western North Carolina, central Tennessee, eastern Alabama, central Texas, the western areas of the Dakotas, southeastern Montana, eastern Wyoming, east-central Colorado and southern Arizona (see rural areas 2, 64, 47, 78, 5, 6, 16, 28, 22, 23, 121, 123, 128, 82, 83, 85, 86, 136, 135, 131, 142).

Bargaining Power Alternative A

As mentioned previously, the amount of employment generated for the entire nation increases by 20 percent under Bargaining Power Alternative A. In each of the farm production regions, more employment would be generated under this policy alternative than under the Land Retirement Alternative. However, numerous rural areas would have less employment generated under Bargaining Power Alternative A than under the base alternative. While for the entire nation the number of acres in production under Bargaining Power Alternative A is only 2 percent less than under the Land Retirement Alternative, there would be 46 percent decrease in the number of acres in production in the rural areas which have significantly less employment generated under Bargaining Power Alternative A.

In western South Dakota, northeastern Oklahoma, and southeastern California the production of wheat is markedly lower under Bargaining Power Alternative A than under the Land Retirement Alternative (see rural areas 85, 86, 88, 105, 143). This decrease in wheat production would be the primary cause of the reduced amount of employment generated in these rural areas under Bargaining Power Alternative A. Decreased soybean production is the primary reason for decreased employment generation estimates for this policy alternative in western North Carolina, northern Georgia, southern Alabama, north-central Louisiana and in northeastern and western Texas (see rural areas 16, 18, 24, 21, 58, 110, 115, 118, 119, 127). The production of both feedgrains and soybeans would decrease in southern Ohio, west-central Wisconsin, central North Carolina, southwestern Kansas, and central Nebraska (see rural areas 36, 37, 76, 9, 93, 104). The reduced production of these two crops would lead to decreases in the amount of economic activity and employment that occurs in these rural areas. In central Washington, south-central Colorado, and southwestern North Dakota, decreased production of feedgrains leads to reductions in the amount of employment generated in these rural areas under Bargaining Power Alternative A (see rural areas 132, 150, 83). The above-mentioned rural area in southwestern North Dakota is the only rural area in our model which wouldn't have any production of the endogenous crops under Bargaining Power Alternative A. Therefore, the amount of employment generated is estimated to fall to zero under Bargaining Power Alternative A in this rural area.

Bargaining Power Alternative B

Only 13 of the model's 150 rural areas would have significantly less employment generated under Bargaining Power Alternative B than they would have under the Land Retirement Alternative. (All of these 13 were among the 24 rural areas which had less employment generated under Bargaining Power Alternative A). While for the entire nation the acreage in production under Bargaining Power Alternative B would decrease by 12 percent from its Land Retirement Alternative level, the acreage in production would decrease by 47 percent in the 13 rural areas that have less employment generated under the former policy alternative. These rural areas are located in western North Carolina, northern Georgia, southern Alabama, northern Louisiana, southeastern Oklahoma, northeastern Texas, central South Dakota, southwestern Kansas, south-central Colorado and southeastern California (see rural areas 16, 18, 24, 21, 58, 110, 115, 118, 119, 88, 104, 132, 143).

VI. IMPACT ON THE NORTH CENTRAL REGION

Now we will turn our attention to a detailed analysis of the potential effects of alternative farm programs on the income and employment of rural areas and agriculturally-related industries of the North Central Region of the United States. The geographic area which will be analyzed is that shown in Figure 10 where the small, bounded areas represent the 62 individual rural areas which make up the region. (The rural areas of the other states have been left out of Figure 10 to emphasize the North Central Region. However, detailed data also are available for the 88 rural areas outside the North Central Region.) Special attention is devoted to the North Central States (North Dakota, South Dakota, Nebraska, Kansas, Missouri, Iowa, Illinois, Indiana, Ohio, Michigan, Wisconsin and Minnesota) since a special research program has been established for these states through the North Central Regional Center for Rural Development. The North Central Region embraces three of the major agricultural producing areas of the United States. Within it are the Lake States region, noted for its dairy and grain production, the Corn Belt region, noted for the production of feedgrains, soybeans, swine and fed beef, and the Northern Plains region, famous for its cow-calf ranches and wheat farms.

A second reason for selecting this region for special analysis is that the North Central Region produces a major share of the agricultural output of the United States. In 1970, farmers in this region received 43 percent of the realized gross farm income earned in the nation that year. In addition a majority of the cropland acres devoted to the crops endogenous to this study (wheat, feedgrains, soybeans and cotton) have traditionally

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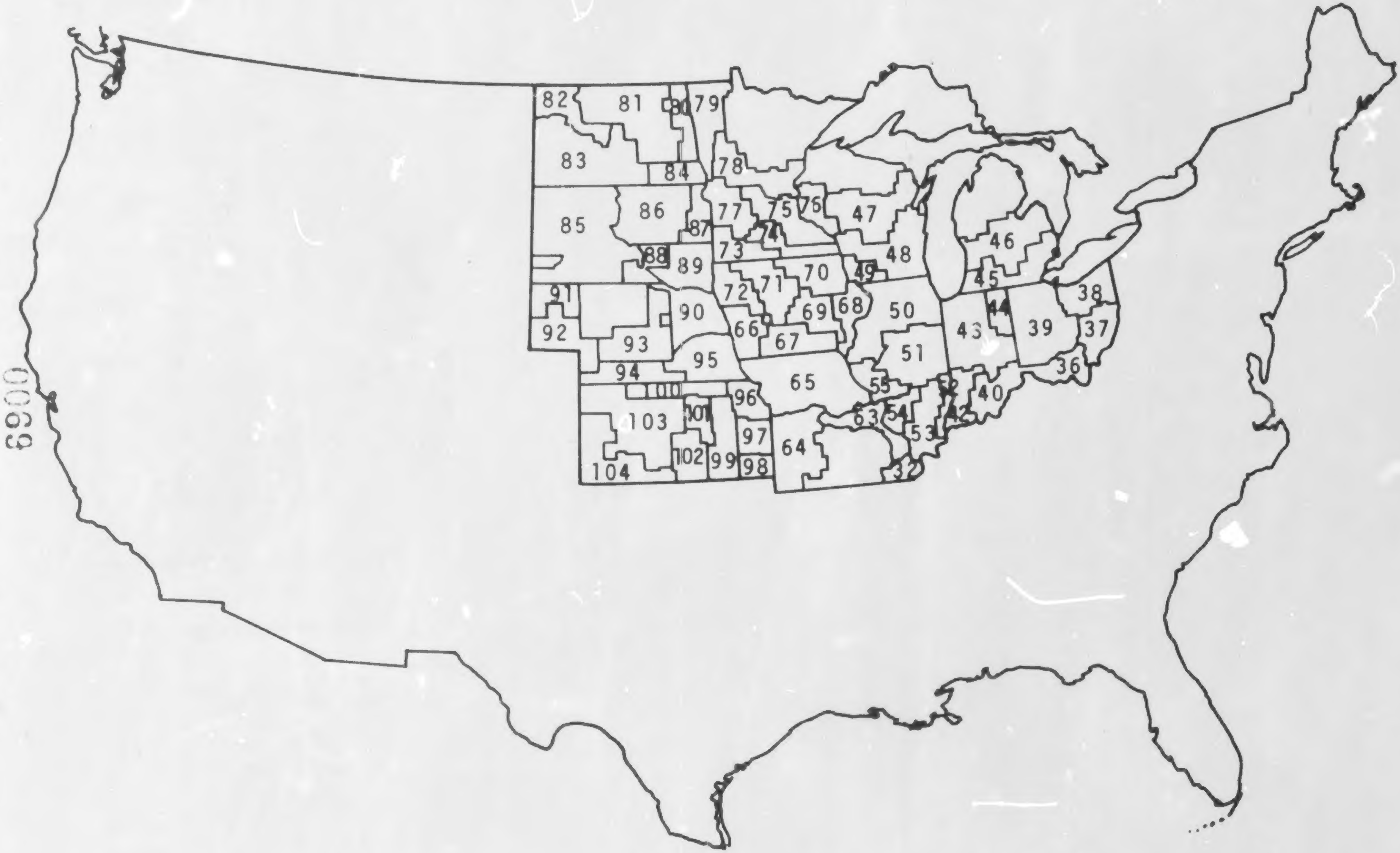
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Figure 10. Location of the 62 rural areas within the North Central Region.

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been located here. In 1969, 63 percent of the acres devoted to the production of these crops was located in this region. Since government farm programs have traditionally had a direct effect on these crops, the people in the North Central Region who derive their incomes from agriculturally-related occupations would have a direct interest in government farm programs.

A third reason for focusing on the North Central Region is because many of the people of this region reside in rural communities and work in agriculturally-related occupations that would be affected by changes in the farming industry resulting under alternative farm programs. In 1970 the rural population of the North Central Region was 16.1 million people or almost 30 percent of the people who lived in rural areas of the United States that year. In addition to farmers and farmworkers, these are people who live and work in small, rural communities and derive much of their income by providing services to the farming sector. As has been discussed previously, these people have borne much of the burden associated with the rapid technological advance of the agricultural industry in the United States. To these people decreased employment opportunities may refer to a relative or neighbor who is forced to move to a metropolitan area to find work. Any reduction in the economic base of their community is directly related to the quality of education their children receive and the property taxes they pay. Changes in government farm policies that affect the welfare of rural people will have considerable impact on the North Central Region as 28 percent of the people living in this region in 1970 were classified as living in rural areas.

The region contains 62 of the rural areas which serve as a foundation for this study. On the average, each of these rural areas include 15 counties. Thus, these areas are larger than a rural community as it is conventionally known. However, the results presented for individual rural areas within the North Central Region do suggest how different farm program alternatives would affect the amount of income and employment generated by production of the endogenous crops in rural areas and in their economic subsystems which are rural communities.

We will first summarize briefly the effect of the four policy alternatives on crop acreage and production throughout the individual rural areas of the North Central Region. We will then examine the indirect effects that these changes would have on the employment and income generated in rural areas throughout the region.

Cropland Acreage Effects

This section describes the effects of the four policy alternatives on the acreage in production in the North Central Region.

Free Market Alternative

The cropland acreage in production, nationally, is at its highest level of the four policy alternatives under the Free Market Alternative. When farm prices are at the low level associated with the Free Market Alternative, the quantity of each of the endogenous crops demanded reaches its highest level. Since there are no production restraints associated with the Free Market Alternative, cropland acreage can be concentrated in higher yielding areas under this policy alternative. In the Corn Belt region the cropland acreage in production under the Free Market Alternative is 9.2 million acres greater than for any of the other policy alternatives, and in the Lake States region the cropland acreage in production under the Free Market Alternative is 2.4 million acres greater than for any of the other policy alternatives. However, in the Northern Plains region, the cropland acreage in production under the Free Market Alternative would be slightly lower than under the Land Retirement Alternative. This would occur because cropland acreage can be concentrated in higher yielding areas forcing some of the rural areas of this region to idle part or all of their cropland.

In most of the rural areas in the region, more cropland acres would be in production under the Free Market Alternative than under the other three policy alternatives. However, seven of the region's rural areas would not produce any of the endogenous crops under the Free Market Alternative and two other rural areas would have fewer acres in production under this policy alternative than in any of the other policy alternatives. The seven rural areas estimated to have no production are rural areas 64 in southwestern Missouri, 47 in central Wisconsin, 82 and 83 in western North Dakota, 85 and 86 in central and western South Dakota, and 78 in western Minnesota. The two rural areas that would have their lowest production levels under the Free Market Alternative are rural areas 81 in central North Dakota and 87 in northeastern South Dakota. Since production is concentrated in higher yielding areas and no cropland is diverted from production under the Free Market Alternative, less acreage would be required in these seven rural areas under this policy alternative than under the other three policy alternatives.

Land Retirement Alternative

Under the Land Retirement Alternative, production restraints are imposed to insure that each of the rural areas would have cropland in production under this policy alternative. This means that some rural areas would have less cropland acreage in production under the Land Retirement Alternative than under the Free Market Alternative. Under the Land Retirement Alternative there would be 13.0 million fewer acres in production in the Corn Belt and Lake States regions than would be in production under the Free Market Alternative. In contrast there are 500,000 more acres in production in the Northern Plains region under the Land Retirement Alternative than for any of the other three policy alternatives. Six of the previously mentioned seven rural areas that would have their lowest level of cropland acreage in production under the Free Market Alternative would have their highest level of production under the Land Retirement Alternative. The seventh rural area, rural area 87 in northwestern South Dakota, would have more cropland acreage in production under Bargaining Power Alternative A.

Bargaining Power Alternative A

Under Bargaining Power Alternative A, the cropland acreage in production is slightly greater than under the Land Retirement Alternative in the Corn Belt and Lake States regions. While restrictions are placed on the acreage in production in each rural area, the cropland that would be diverted under the Land Retirement Alternative would be available for production under Bargaining Power Alternative A. In these two farm production regions, 19 of the 37 rural areas would have more cropland acreage in production under Bargaining Power Alternative A than under the Land Retirement

Alternative. These 19 rural areas can use part of the cropland acreage that would be diverted under the Land Retirement Alternative, and thereby can increase their acreage in production under Bargaining Power Alternative A. In the other 18 rural areas, the lower demands associated with Bargaining Power Alternative A would be met without increasing production in these rural areas.

In the Northern Plains region there would be 4.7 million fewer acres in production under Bargaining Power Alternative A than under the Land Retirement Alternative. The lower demands for the endogenous crops associated with Bargaining Power Alternative A would require less cropland acreage to be in production than under the Land Retirement Alternative in most of the rural areas in this region. Sixteen of this region's 25 rural areas would have fewer acres in production under this policy alternative than they do under the base alternative. One of these, rural area 83 in southwestern North Dakota, would not produce any of the endogenous crops under Bargaining Power Alternative A.

Bargaining Power Alternative B

The higher farm prices associated with Bargaining Power Alternative B reduce the quantity of the endogenous crops demanded to a level lower than under any of the other policy alternatives. In the entire North Central Region the cropland acreage in production under Bargaining Power Alternative B would be 10 percent lower than under Bargaining Power A, 12 percent lower than under the Land Retirement Alternative, and 21 percent lower than under the Free Market Alternative. This low level of production would occur throughout the North Central Region under Bargaining Power Alternative B.

Under this policy alternative there would be 10 percent fewer cropland acres in production in the Lake States and Corn Belt regions and 15 percent fewer cropland acres in production in the Northern Plains region than there would be under the Land Retirement Alternative.

Income and Employment Effects

This section describes the income and employment effects of the four policy alternatives for the North Central Region.

Free Market Alternative

Figure 11 compares the amount of income and employment generated under the Free Market Alternative with the amount of income and employment generated under the Land Retirement Alternative for the North Central Region. Since the income and the employment generation indices developed in this study are directly related to each other, we will not separate the two effects in this section for purposes of brevity.[1] As Figure 11 shows, 16 rural areas would have more income and employment generated under the Free Market Alternative than under the Land Retirement Alternative. The acreage in production in the entire North Central Region would increase by 10 percent under the Free Market Alternative. However, the number of acres in production increases by 27 percent in the 16 rural areas that have more income and employment generated under the Free Market Alternative. In 10 of these rural areas the amount of income and employment generated increases by less than 5 percent. These 10 rural areas are rural areas 45 and 46 in southern Michigan, 68 in southeastern Iowa, 71 and 72 in northwestern

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[1] These variables have been defined previously in the section dealing with the methods and terms used in the study.

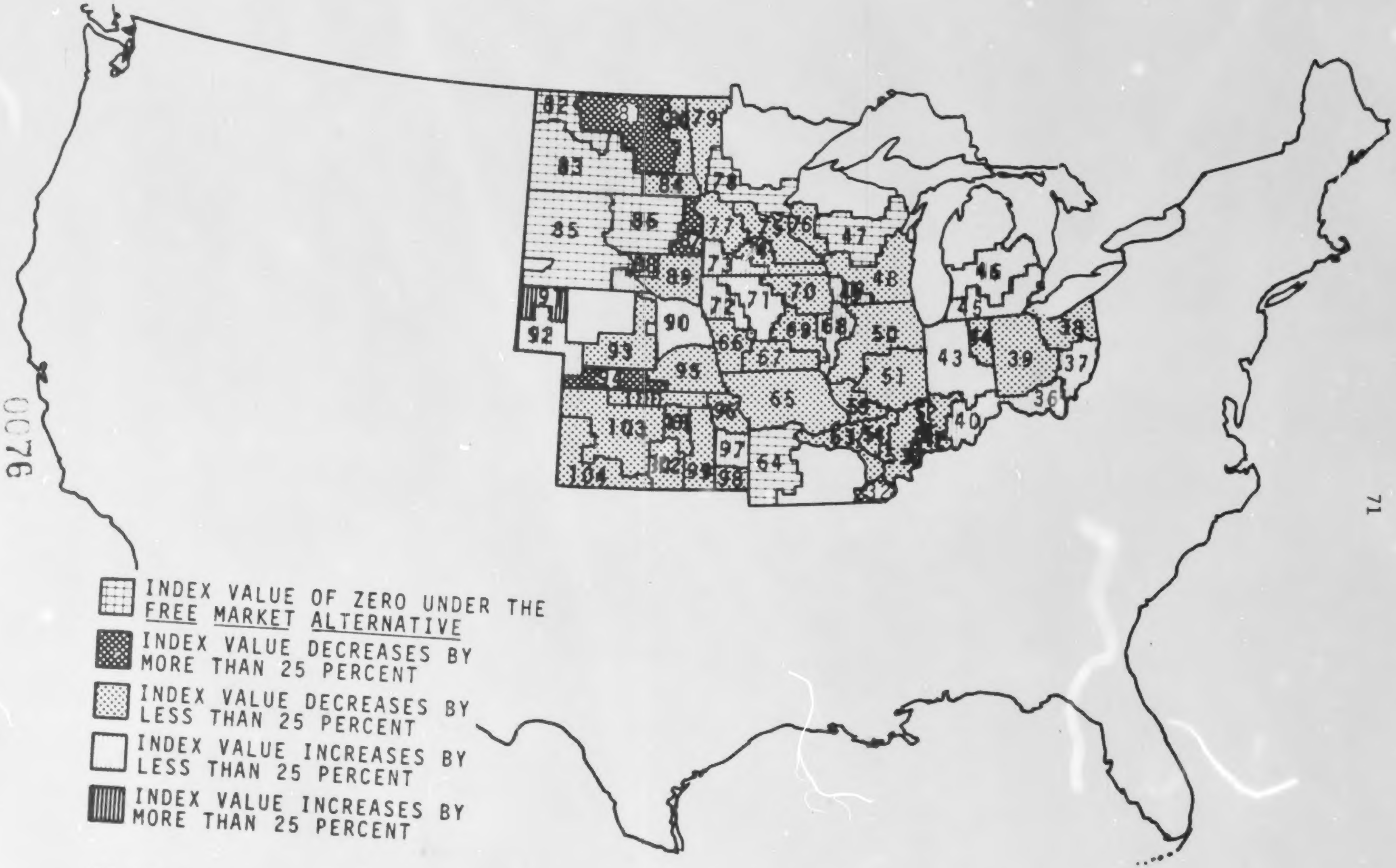
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Figure 11. Comparison of the amount of income and employment generated under the Free Market Alternative with the amount of income and employment generated under the Land Retirement Alternative for the North Central Region.

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Iowa, 73 in southwestern Minnesota, 49 in southwestern Wisconsin, 90 in northeastern Nebraska, 92 in southwestern Nebraska, and 97 in eastern Kansas. Of the six rural areas in which the amount of income and employment generated increases by more than 5 percent under the Free Market Alternative, four of them (rural areas 36 and 37 in southern Ohio and 40 and 43 in Indiana) would produce feedgrains almost exclusively under this policy alternative. The other two rural areas (rural areas 88 in central South Dakota and 91 in northwestern Nebraska) produce over 60 percent more wheat under the Free Market Alternative than they would produce under the Land Retirement Alternative.

Under the Free Market Alternative seven of the rural areas in the North Central Region are estimated to have no production of the crops endogenous to this study. Therefore, the amount of income and employment generated by production of these crops falls to zero under this policy alternative in these rural areas. The seven rural areas in which the amount of income and employment generated is estimated to fall to zero are rural areas 82 and 83 in western North Dakota, 85 and 86 in western South Dakota, 64 in western Missouri, 47 in central Wisconsin and 78 in central Minnesota. In addition, the amount of income and employment generated in another five of the region's rural areas would decrease by more than 25 percent under the Free Market Alternative. In two of these five rural areas (81 in north-central North Dakota and 87 in northeastern South Dakota) the acreage in production under the Free Market Alternative would be 55 percent lower than under the Land Retirement Alternative. Since there are no production restraints associated with the Free Market Alternative, the production of feedgrains can shift out of rural areas 32 in southeastern Missouri, 52 in eastern Illinois and 94 in southern Nebraska. This reduction in the production of feedgrains leads to a more than 25 percent decrease in the amount of income and employment generated under the Free Market Alternative in these three rural areas.

In the remaining 34 rural areas of the North Central Region, the amount of income and employment generated would decrease under the Free Market Alternative but by less than 25 percent. These rural areas would have more cropland acreage in production under the Free Market Alternative than under the Land Retirement Alternative, but the lower farm prices associated with the Free Market Alternative would more than offset the increased production in these areas.

Bargaining Power Alternative A

While the effect of the Free Market Alternative on the amount of income and employment generated in the North Central Region is largely negative, the opposite is true under Bargaining Power Alternative A. Only 11 rural areas in the North Central Region would have less income and employment generated under Bargaining Power Alternative A than under the Land Retirement Alternative (Figure 12). However, of the 51 rural areas that would have more income and employment generated under Bargaining Power Alternative A than under the base alternative, only 22 of them would have increases of more than 25 percent. In the remaining 29 rural areas, the amount of income and employment generated would increase but by less than 25 percent under Bargaining Power Alternative A.

Three of the 11 rural areas that would have decreases in the amount

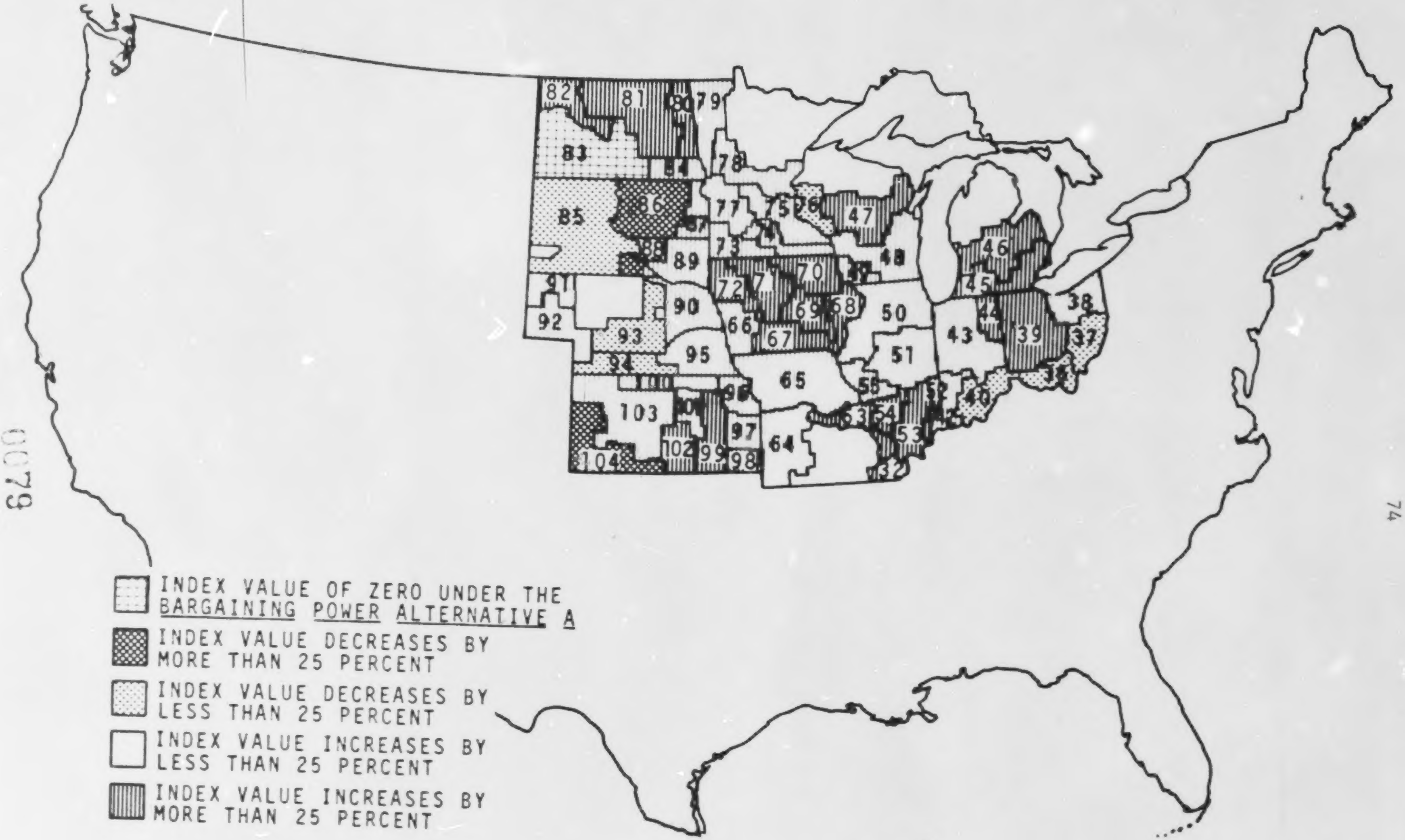
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Figure 12. Comparison of the amount of income and employment generated under the Bargaining Power Alternative A with the amount of income and employment generated under the Land Retirement Alternative for the North Central Region.

of income and employment generated under Bargaining Power Alternative A are located in the southeastern corner of the Corn Belt region. The amount of income and employment generated under Bargaining Power Alternative A decreases by 18, 12 and 4 percent, respectively, in rural areas 36 and 37 in southern Ohio and 40 in southeastern Indiana. This decrease in income and employment is due to a 29 percent decrease in feedgrains production estimated for these rural areas under this policy alternative. Rural area 76 in west-central Wisconsin is the only rural area in the Lake States region which would have less income and employment generated under Bargaining Power Alternative A than under the Land Retirement Alternative. The reduced demand for soybeans under this policy alternative would cause a 75 percent decrease in soybean production in this rural area. Since the production of feedgrains would remain constant between the two policy alternatives, the higher farm prices associated with Bargaining Power Alternative A would be able to maintain the amount of income generated in this rural area at only eight percent less than under the Land Retirement Alternative and the amount of employment generated at 11 percent less than under the base alternative.

The Northern Plains region would have seven rural areas which have less income and employment generated under Bargaining Power Alternative A than under the Land Retirement Alternative. One of them is rural area 83 in southwestern North Dakota which would not produce any of the endogenous crops under Bargaining Power Alternative A. This means rural area 83 would have no income and employment generated from the production of these crops under this policy alternative. Three rural areas in South Dakota (rural areas 85, 86 and 88 in central and western South Dakota) would have a 50 percent decrease in wheat production compared to the Land Retirement Alternative because of lower demands for wheat and tighter production restrictions associated with Bargaining Power Alternative A. This decrease in wheat production leads to the reduced amount of income and employment generated in these three rural areas under this policy alternative. In rural areas 93 and 94 in central Nebraska and rural area 104 in southwestern Kansas, the decrease in the amount of income and employment generated is due primarily to a 55 percent reduction in the production of feedgrains under Bargaining Power Alternative A.

The 22 rural areas in which the amount of income and employment generated increases by more than 25 percent under Bargaining Power Alternative A are those rural areas which utilize the cropland that would be diverted under the Land Retirement Alternative. While these rural areas would produce less of one of the endogenous crops under Bargaining Power Alternative A than under the Land Retirement Alternative, they are able to increase their production of the other endogenous crops and benefit from the higher farm prices of Bargaining Power Alternative A. For example, in rural areas 39 in northwestern Ohio, 44 in northeastern Indiana and 45 in southern Michigan, the production of wheat and soybeans would increase markedly under Bargaining Power Alternative A while the production of feedgrains would be much lower than it would be under the Land Retirement Alternative. In rural areas 46 in central Michigan and 47 in central Wisconsin, where wheat production decreases significantly under Bargaining Power Alternative A, the production of feedgrains would increase to take the place of the lost wheat production.

The amount of income and employment generated under Bargaining Power Alternative A increases by at least 25 percent in all of the rural areas in Iowa (rural area 66 in southwestern Iowa would have an income index value of 125). This increase in income and employment would occur despite a four percent decrease in feedgrain acreage in these rural areas under this policy alternative. A 15 percent increase in soybean production coupled with the higher farm prices of Bargaining Power Alternative A can counteract the decreased feedgrains production and leads to higher income and employment levels in Iowa under this policy alternative. In rural areas 52, 53, and 54 in southern Illinois and 63 in southeastern Missouri, the increased production of feedgrains would offset the decreased production of wheat and soybeans under Bargaining Power Alternative A. This shift in the production mix contributes to the increased amount of income and employment generated under Bargaining Power Alternative A in these rural areas.

Rural area 32 in southeastern Missouri presents a unique case for the North Central Region under Bargaining Power Alternative A. This rural area has more cropland in production under this policy alternative than under the Land Retirement Alternative. However, almost all of this increase in acreage would be devoted to cotton production. The introduction of cotton production with its large income and labor generation factors leads to a 64 percent increase in the amount of income generated and a 85 percent increase in the amount of employment generated in rural area 32 under Bargaining Power Alternative A.

The six rural areas in the Northern Plains region in which the amount of income and employment generated under Bargaining Power Alternative A increases by more than 25 percent are rural areas 80, 81, and 82 in northern North Dakota and 98, 99 and 102 in southeastern Kansas. While the acreage devoted to wheat under Bargaining Power Alternative A decreases by 36 percent, the total acreage in production in these six rural areas under this policy alternative would be slightly higher than under the Land Retirement Alternative. The cropland which produces wheat under the Land Retirement Alternative would be used to produce feedgrains under Bargaining Power Alternative A. This increase in the production of feedgrains allows these six rural areas to experience relatively large increases in the amount of income and employment generated under Bargaining Power Alternative A. The remaining 29 rural areas of the North Central Region, in which the amount of income and employment generated under Bargaining Power Alternative A increases but by less than 25 percent, would have nearly the same levels of production in both the Land Retirement Alternative and Bargaining Power Alternative A. They are able to shift their production mix to counteract the tighter production restrictions of Bargaining Power Alternative A and would have more income and employment generated under this policy alternative than under the Land Retirement Alternative.

Bargaining Power Alternative B

Figure 13 compares the amount of income and employment generated under Bargaining Power Alternative B with the amount generated under the Land Retirement Alternative for the North Central Region. As can be seen in Figure 13, the higher farm prices associated with Bargaining Power Alternative B would work effectively to increase the amount of income and employment generated throughout the region. Only six rural areas would have less

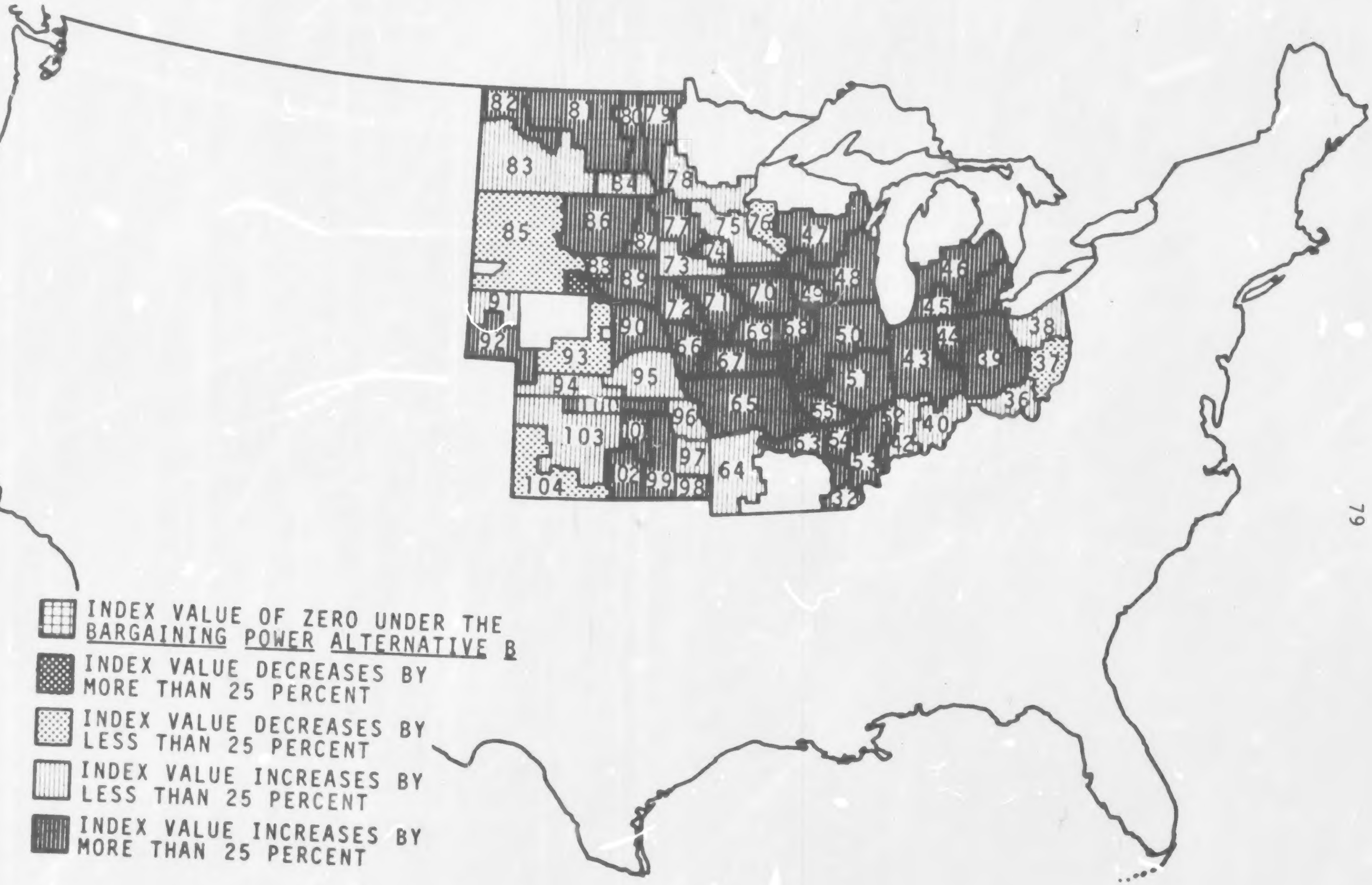
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Figure 13. Comparison of the amount of income and employment generated under the Bargaining Power Alternative B with the amount of income and employment generated under the Land Retirement Alternative for the North Central Region.

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income and employment generated under Bargaining Power Alternative B than under the Land Retirement Alternative. In four of the six rural areas, the amount of income and employment generated under Bargaining Power Alternative B is within five percent of what it would be under the base alternative. These four rural areas are rural areas 37 in southeastern Ohio, 76 in west-central Wisconsin, 85 in western South Dakota, and 93 in central Nebraska. In rural area 104 in southwestern Kansas the acreage in production would decrease by 20 percent under this alternative. However, this would be only a slightly larger decrease than would occur for the Northern Plains region as a whole. This rural area, which would produce primarily feedgrains under the Land Retirement Alternative, would primarily produce wheat under Bargaining Power Alternative B. This shift in its production mix leads to the decrease in income and employment that would be experienced in this rural area under Bargaining Power Alternative B. Rural area 88 in central South Dakota would experience a drastic reduction in the amount of income and employment generated under Bargaining Power Alternative B compared to the Land Retirement Alternative. This rural area produces as much wheat as it would be allowed under Bargaining Power Alternative B. However, the low demands associated with this policy alternative would not require rural area 88 to produce any of the other endogenous crops which would lead to the decrease in the amount of income and employment generated in rural area 88 under Bargaining Power Alternative B.

The amount of income and employment generated under Bargaining Power Alternative B is higher than it would be under the Land Retirement Alternative for the remaining 56 rural areas of the North Central Region. The amount of income and employment generated would increase by more than 25 percent in 40 of these 56 rural areas due to higher farm prices associated with Bargaining Power Alternative B. Rural area 32 in southeastern Missouri would have the largest increase in the amount of income and employment generated of any of the rural areas in the North Central Region because of its production of cotton under Bargaining Power Alternative B. For this policy alternative the amount of income would increase by 93 percent and the amount of employment generated by 118 percent over the amount that would be generated under the Land Retirement Alternative in this rural area.

VII. PRODUCER AND FARM INCOME EFFECTS

Implementation of any government farm policy has direct impacts on the quantity of farm commodities produced and on the income derived from farming. The amount and pattern of production, as well as the levels of prices and direct payments to farmers, not only determine the magnitude of net farm income under each program alternative but also has widespread impacts throughout rural areas. The pattern and amount of production determines the amount of inputs used and thus the amount of employment and income generated by the service sectors supplying them. The level of farm income would be reflected in consumption expenditures of farm families and thus would be reflected in income and employment generated in rural businesses that supply consumer goods and services. For this reason, we summarize the levels of production and farm income generated under each of the policy alternatives. While the models provide these quantities at the level of individual producing areas and farm production regions, the data are presented only at the national level for purposes of brevity. Table 7 includes projected levels of production, per acre yields, and acreages of the major crop commodities for each of the alternative government policies considered and allows comparisons with actual 1969 values of these variables.

Wheat Production

With an estimated 1,661 million bushels, wheat production would be largest under the Free Market Alternative. Wheat production under the Land Retirement Alternative would nearly equal the 1.46 billion bushels produced

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Table 7. Estimated production, acreages and yields for each of the policy alternatives in 1975 and actual 1969 values for comparison.

Crop	Production, acreage, and yield per acre 1969[a]	1975 Estimated production, acreage, and yield per acre			
		Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
			Total Production (000)		
Wheat (bu.)	1,460,000	1,661,500	1,417,141	1,538,332	1,432,776
Feed grains (ton)[b]	174,600	181,892	174,250	158,207	150,090
Soybeans (bu.)	1,126,000	1,293,414	1,174,117	1,075,025	974,864
Cotton (500 lb. bales)	10,000	11,903	11,303	10,703	10,103
			Harvested Acreage (000)		
Wheat	47,577	54,695	46,417	50,214	44,941
Feed grains	95,584	87,501	86,225	82,299	75,149
Soybeans	40,982	48,082	41,422	37,352	32,199
Cotton	11,882	11,082	10,244	9,967	9,010
			Yield per Harvested Acre		
Wheat (bu.)	30.7	30.3	30.5	30.6	31.9
Feed grains (bu.)[b]	63.4	74.2	72.2	68.7	71.3
Soybeans (bu.)	27.5	26.9	28.4	28.8	30.3
Cotton (lbs.)	434.0	537.0	552.0	537.0	561.0

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a/ Source: Crop Production 1970 Annual Summary, USDA SRS, December 1970.

b/ Feed grains are reported on a corn equivalent basis.

in 1969. More wheat would be produced under Bargaining Power Alternative A than under the Land Retirement Alternative because of an increased use of wheat for feed under the prices of Bargaining Power Alternative A. The number of acres of cropland devoted to wheat production varies directly with the projected levels of production. For the four policies considered, wheat acreage would be highest (54.7 million acres) under the Free Market Alternative and lowest (44.9 million acres) under Bargaining Power Alternative B. Projected wheat yields would vary directly with the price of wheat and inversely with acreage under the policy alternatives. The Free Market Alternative would have the lowest projected yield of 30.3 bushels per acre while 31.9 bushels per acre under Bargaining Power Alternative B would be highest (Table 7).

Feedgrains Production

The largest quantity of feedgrains produced of the four policies considered would be the 181.9 million tons estimated for the Free Market Alternative. The high feedgrains yield under this alternative results because the market forces concentrate production on land best suited for these crops. As in the case of wheat, estimated feedgrains production under the Land Retirement Alternative is similar to 1969 actual production. Because of the greater amount of wheat used for feed in Bargaining Power Alternative A, feedgrains production in that alternative would be 16 million tons of feed units less than in the Land Retirement Alternative but only 8 million tons more than for Bargaining Power Alternative B (Table 7).

Soybean Production

Soybean production and acreage are largest for the Free Market Alternative and as a result this policy alternative would have the lowest per acre yield estimate of the policies analyzed. The lower yield results because feedgrains would be produced on a greater proportion of the high quality grain land under free market conditions than in the other policy alternatives. Hence, while acreage would be largest under the Free Market Alternative, soybeans would be pushed out by feedgrains to the less productive land. Production, yield, and acreage under the Land Retirement Alternative are slightly higher than the actual 1969 values for these variables. Both Bargaining Power models have projected levels of production and acreages used for soybeans which are lower than in 1969. However, projected yields are higher than 1969 actual yields.

Cotton Production

Cotton yield under each policy alternative would be higher than the 1969 actual yield. In the Free Market Alternative this is due to the concentration of cotton production on high yielding cotton land. For other solutions, it is because of higher cotton price than in 1969, which would induce higher fertilizer rates and other improved technology. Estimated cotton production ranges from a high of 11.9 million bales under the Free Market Alternative to a low of 10.1 million bales under Bargaining Power Alternative B (Table 7).

Income from Farming

Table 8 summarizes income for the farming sector under each of the policy alternatives. Estimated net farm income ranges from $9.2 billion in the Free Market Alternative to $27.2 billion in Bargaining Power Alternative B. The projected net return from farming under the Land Retirement Alternative is $3.3 billion less than under Bargaining Power Alternative A. However, the lower prices of the Land Retirement Alternative are more than offset by government payments to the farming sector. (No government payments are assumed under the Bargaining Power Alternatives.) Therefore, net farm income under the Land Retirement Alternative is slightly higher than under Bargaining Power Alternative A.

Table 8. Net farm income in 1975 under the four policy alternatives, with actual 1969 values for comparison.

	Net farm income 1969[a]	1975 Estimated net farm income			
		Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	(Million dollars)[b]				
Cash receipts from farm marketings	47,229	51,914	57,222	60,342	64,369
Production expenses [c]	38,444	47,293	43,392	43,201	41,762
Net receipts from farm marketings	8,785	4,621	13,830	17,141	22,607
Non-money income and inventory change[d]	3,949	4,149	4, 149	4, 149	4,149
Net returns from farming	12,734	8,770	17,979	21,290	26,756
Income from government sources[e]	3,794	420	4,555	420	420
Total net farm income	16,528	9,190	22,534	21,710	27,176

a/ Source: Farm Income Situation, USDA ERS, July 1970.

b/ All values are measured in 1970 equivalent dollars with no adjustment for inflation in 1975.

c/ For a discussion of methods used to estimate production expenses, see Madsen and Heady, Bargaining Power Programs.

d/ Includes the value of home consumption and the rental value of farm dwelling.

e/ Includes ACP, Great Plains Conservation, Sugar Act and Wool Act payments plus direct payments for the retirement of cropland for 1969 and the Land Retirement Solution.

VIII. CONSUMER FOOD COSTS

Each set of prices and production levels would be associated with a level of consumer food expenditures. Table 9 shows estimated total consumer food expenditures for each of the four policy alternatives analyzed.[1] Estimated total consumer expenditures for food are greater than 1969 actual food expensitures under all four policy alternatives. Part of this increase is due to growth in population between 1969 and 1975. Under alternatives with higher farm prices than in 1969, part of the increase also is due to higher costs for the farm commodities going into food. Growing consumer preference for higher quality and more expensive, convenience-oriented food products also add to costs between 1969 and 1975.

Projected total food expenditures are lowest under the Free Market Alternative and highest under Bargaining Power Alternative B. The range is slightly over $12.1 billion between these two solutions. While projected net farm income is higher under the Land Retirement Alternative than under Bargaining Power Alternative A, estimated total food expenditures are $3.8 billion less under the Land Retirement Alternative. The higher net farm income under the Land Retirement Alternative results from government payments for cropland retirement. These payments under the Land Retirement Alternative more than offset higher commodity prices under Bargaining Power Alternative A.

Total consumer food expenditures in Table 9 were calculated as the product of the retail prices for each solution multiplied by the quantity

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[1] See Appendix C for methods used to calculate consumer food costs.

Table 9. Total and per capita consumer food expenditures under each policy alternative, with actual values in 1969 for comparison.[a]

	Consumer food expenditures 1969[a]	1975 Estimated consumer food expenditures[b]			
		Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
		Total expenditures (Million dollars)[c]			
Meat products	28,490	33,671	36,546	39,107	41,748
Poultry and eggs	7,415	6,529	7,704	8,939	10,565
Dairy products	14,944	22,477	22,477	22,477	22,477
Other[d]	44,446	61,061	61,061	61,061	61,061
All products	95,285	123,738	127,788	131,584	135,851
		Per capita costs			
Per capita costs	472	567	586	603	623

a/ Source: Food Consumption, Prices and Expenditures, Supplement for 1970.

b/ For a breakdown of the 1975 estimates, see Appendix Table C.1.

c/ All values for 1975 are measured in 1970 equivalent dollars with no adjustment for inflation to 1975.

d/ Includes bakery products, fruits and vegetables, miscellaneous items, and grain mill products.

of food to be purchased at these prices. Hence, the $3.8 billion increase in food expenditures of the Bargaining Power Solution A over the Land Retirement Alternative does not completely reflect the difference in consumer well-being between the two policy alternatives because different amounts of food would be consumed. For example, the expenditure for food would be the same if a consumer bought 10 apples at a dime apiece or one apple for a dollar. However, he would not consider himself equally well-off in the two situations.

In an attempt to account for this welfare phenomenon, consumer food expenditures were recalculated using the price level computed for each policy alternative but requiring that the quantity of food consumed would be held constant at the level of the Land Retirement Alternative. These results are presented in Table 10 with the recalculation being made for all policy alternatives.

When calculated in this manner, total consumer food expenditures increase by $21.1 billion between the Free Market Alternative and Bargaining Power Alternative B which is $9 billion more than the differential estimated by the previous method. Total consumer food expenditures increase by $6.6 billion between the Land Retirement Alternative and Bargaining Power Alternative A when the constant quantity restriction is imposed. Without this restriction, consumer food expenditures varied by only $3.8 billion for these two alternatives. The values in Table 9 are important as estimates of what food expenditures would be under each of the policy alternatives while the constant quantity estimates of Table 10 reflect another aspect of consumer welfare under the several policy alternatives.

Table 10. Consumer food expenditures with quantity consumed held equal to the quantity consumed in the Land Retirement Alternative in each of the policy alternatives.

	1975 Estimated consumer food expenditures			
	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	(Million dollars)[a]			
Meat products	31,035	36,546	42,060	48,650
Poultry and eggs	6,645	7,704	8,760	10,170
Dairy products	22,477	22,477	22,477	22,477
Other[b]	61,061	61,061	61,061	61,061
Total	121,218	127,788	134,358	142,358

[a] All values for 1975 are measured in 1970 equivalent dollars with no adjustment for inflation to 1975.

[b] Includes bakery products, fruits and vegetables, miscellaneous items, and grain mill products.

IX. SUMMARY OF EACH POLICY ALTERNATIVE

This study is concerned with the potential impacts of four alternative farm policies on the farming sector and on the rural communities and agriculturally-related industries that serve the farming industry. To present these potential effects quantitatively, we calculate the value of certain variables that relate to the well-being of the people of rural America for each of four policy alternatives. Figure 14 presents these variables at the national level for each of the four policy alternatives analyzed. The following discussion summarizes the potential impact of the four policy alternatives on these variables. In a later section we will relate these variables to some of the policy implications they reveal regarding the well-being of farmers and citizens of rural communities.

Free Market Alternative

Under the Free Market Alternative, there would be no direct government intervention in the market either through price supports or direct payments to farmers for diverting cropland. Therefore, the location of production would not be restricted by government quotas but instead would depend solely on market supply and demand forces and the cost of producing each crop in different locales. Since the location of production is not restrained by non-market forces under the Free Market Alternative, the cropland acreage in production under this policy alternative, 201.4 million acres, would be higher than under the other three policy alternatives. There would be 17 million more acres in production under the Free Market Alternative than under Land Retirement Alternative which would have the

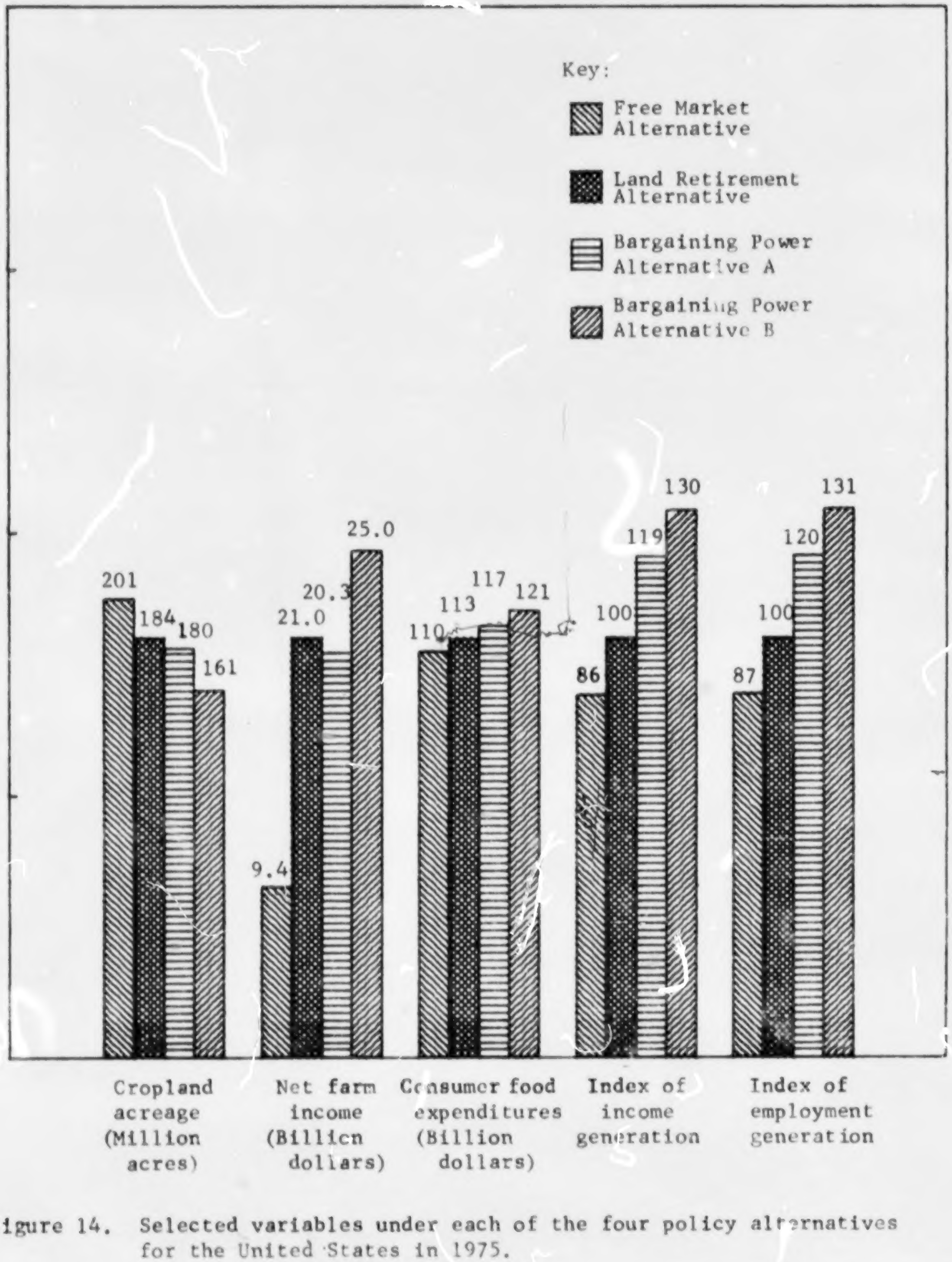

Figure 14. Selected variables under each of the four policy alternatives for the United States in 1975.

next largest cropland acreage in production of the four alternatives.

The relatively large amount of farm commodities that would be produced under the Free Market Alternative would drive farm commodity prices to levels below that of the other three policy alternatives. Since there would be no government payments for diverting cropland, the low farm prices of the Free Market Alternative would in turn force total net farm income to a lower level than under the other three policy alternatives. Net farm income under the Free Market Alternative, $9.2 billion, would be less than 50 percent of the net farm income estimated for any of the other three farm policies. However, the low farm prices of the Free Market Alternative would also lead to the lowest expenditures for food of the four policy alternatives. The total cost of food under the Free Market Alternative, $123.7 billion, would be $4.1 billion less than under the Land Retirement Alternative and $12.1 billion less than under Bargaining Power Alternative B.

Under the Free Market Alternative, the amount of income and employment generated nationally would be 13 percent less than under the Land Retirement Alternative, 27 percent less than under Bargaining Power Alternative A, and 34 percent less than under Bargaining Power Alternative B. Only the Southern Plains region would have more income and employment generated under the Free Market Alternative than under the Land Retirement Alternative. The increased income and employment generated under the Free Market Alternative for this region, which would be due primarily to increased cotton production, would not be spread throughout the Southern Plains region but instead would be concentrated in the rural areas of western and south-central Texas and southwestern Oklahoma.

While the other nine farm production regions and most of the rural areas within them would have less income and employment generated under the Free Market Alternative than under the Land Retirement Alternative, there would be 35 rural areas scattered throughout the nation that would have more income and employment generated under the Free Market Alternative. In these rural areas the cropland acreage in production would increase significantly resulting in increases in the level of economic activity under the Free Market Alternative. These rural areas are located in southern Ohio and Indiana, western Kentucky, western New York, southeastern North Carolina and Georgia, eastern New Mexico, southeastern California, western Nebraska, northeastern Colorado and western Louisiana.

Land Retirement Alternative

The Land Retirement Alternative would be similar to the type of farm program that was in effect in the late 1960's (and in the early 1970's, except for the set-aside provision). Associated with this policy alternative are governmental price supports for feedgrains, wheat, and cotton and direct government payments to farmers for withholding part of their cropland from production. In addition, restraints are placed on the number of acres in a region that can be devoted to specified commodities. Because of the higher farm prices that would result from these acreage restraints, there would be 17 million fewer acres in production under the Land Retirement Alternative than under the Free Market Alternative. The cropland acreage in production under the Land Retirement Alternative, 184.3 million acres, would be 4.5 million acres greater than under Bargaining Power Alternative A and 21.4 million acres greater than under Bargaining Power Alternative B.

The total net farm income under the Land Retirement Alternative, $22.5 billion, would be over twice the total net farm income estimated under the Free Market Alternative but only $824,000 more than estimated under Bargaining Power Alternative A. Under the Land Retirement Alternative, 20 percent of the total net farm income would be composed of government payments to farmers for diverting part of their cropland. These government payments allow the total net income to double between the Land Retirement Alternative and the Free Market Alternative while the total cost of food would be only $4.1 billion higher under the Land Retirement Alternative.

While the amount of income and employment generated nationally under the Land Retirement Alternative is 13 percent higher than under the Free Market Alternative, it would be 19 percent lower than under Bargaining Power Alternative A and 30 percent lower than under Bargaining Power Alternative B. Only 16 of the 150 rural areas would have more income and employment generated under the Land Retirement Alternative than under any one of the other three policy alternatives. Under the Land Retirement Alternative, acreage restraints force production out of the higher yielding rural areas and into these 16 lower yielding rural areas. While these areas would have more income and employment generated under the Land Retirement Alternative than under the other three policy alternatives, they would account for less than 5 percent of the total cropland acreage in production under the Land Retirement Alternative.

Bargaining Power Alternative A

Under both of the Bargaining Power Alternatives, it is assumed that farmers can unite to exert control over market prices and over the amount of farm commodities they would produce. The two Bargaining Power Alternatives differ in the level of farm prices that would prevail under each of them. Farm prices under Bargaining Power Alternative A would be lower than under Bargaining Power Alternative B but would be higher than the farm prices associated with the Land Retirement or Free Market Alternatives (Prices of the major crops under Bargaining Power Alternative A are: \$2.05/bu. for wheat, \$1.75/bu. for feedgrains, \$3.85/bu. for soybeans, \$0.35/lb. for cotton lint).

Under Bargaining Power Alternative A, the cropland acreage in production, 179.8 million acres, would be 4.5 million acres lower than under the Land Retirement Alternative but would be 18.5 million acres greater than under Bargaining Power Alternative B. Due to higher farm prices, the total net farm income under Bargaining Power Alternative A, \$21.7 billion, would be only slightly less than the total net farm income estimated for the Land Retirement Alternative, even though there would be no government payments for diverting cropland under Bargaining Power Alternative A. Of course, the total cost of food also is dependent on the level of farm prices. Total food costs under Bargaining Power Alternative A, \$131.6 billion, would be \$3.8 billion higher than under the Land Retirement Alternative but \$4.3 billion lower than under Bargaining Power Alternative B.

Income and employment generation under Bargaining Power Alternative A would be lower than under Bargaining Power Alternative B for all of the 150 rural areas. The most interesting comparisons, however, are between the amount of income and employment generated under Bargaining Power Alternative A and under the Land Retirement Alternative. While total net farm income would be nearly equal under these two policy alternatives, the amount of income and employment generated nationally would be 19 percent higher under Bargaining Power Alternative A than under the Land Retirement Alternative. Although each of the 10 farm production regions would have more income and employment generated under Bargaining Power A than under the Land Retirement Alternative, 34 of the 150 rural areas would have less income and employment generated under the former alternative. The lower level of farm commodity demand estimated for Bargaining Power Alternative A could be met even though considerably fewer acres would be in production in these 34 rural areas under this policy alternative than under the Land Retirement Alternative. These rural areas are in: southeastern California, southwestern and northeastern Texas, southeastern Oklahoma, western North and South Dakota, central Nebraska, northwestern Kansas, north-central Louisiana, southern Ohio and Indiana, western North Carolina, South Carolina and Georgia, and south-central Alabama.

Bargaining Power Alternative B

The major difference between Bargaining Power Alternative B and Bargaining Power Alternative A is in the level of farm prices that would prevail under each of them. The price farmers receive for their products under Bargaining Power Alternative B would be considerably higher than under Bargaining Power Alternative A (prices of the major crops under Bargaining Power Alternative B are: $2.60/bu. for wheat, $2.10/bu. for feedgrains, $4.45/bu. for soybeans, $0.40/lb. for cotton lint). As under Bargaining Power Alternative A, it is assumed that farmers could exercise effective market control over the prices and the amounts of the commodities they would produce under Bargaining Power Alternative B. Since the farm prices associated with Bargaining Power Alternative B would be higher than in the other three policy alternatives, the quantity of farm commodities produced under Bargaining Power Alternative B would be lower than under the other three policy alternatives. The cropland acreage in production under Bargaining Power Alternative B, 161.3 million acres, would be 40.1 million acres less than under the Free Market Alternative and would be 23.0 million acres less than under the Land Retirement Alternative.

Total net farm income under Bargaining Power Alternative B is estimated at the highest level of any of the policy alternatives. Total net farm income under Bargaining Power Alternative B, $27.2 billion, would be $18.0 billion higher than under the Free Market Alternative, $4.6 billion higher than under the Land Retirement Alternative and $5.5 billion higher than under Bargaining Power Alternative A. While the high farm prices of Bargaining Power Alternative B would lead to relatively high levels of net farm income, they would also be reflected in higher consumer food costs. The total cost of food under Bargaining Power Alternative B, $135.9 billion, would be higher than under any of the other three policy alternatives. It would be $12.1 billion more than under the Free Market Alternative, $8.1 billion more than under the Land Retirement Alternative and $4.3 billion more than under Bargaining Power Alternative A.

Nationally, the amount of income and employment generated under Bargaining Power Alternative B would be 9 percent higher than under Bargaining Power Alternative A, 30 percent higher than under the Land Retirement Alternative and 51 percent higher than under the Free Market Alternative.

Excluding the Southern Plains region, the other nine farm production regions would have more income and employment generated under Bargaining Power Alternative B than under the other three policy alternatives. In the Southern Plains region, the amount of income and employment generated under Bargaining Power Alternative B would be exceeded only under the Free Market Alternative. Of the 150 rural areas in the nation, only 23 of them would have less income and employment generated under Bargaining Power Alternative B than under the Land Retirement Alternative. However in 9 of these 23 rural areas, the amount of income and employment generated under Bargaining Power Alternative B would be within five percent of the amount generated under the Land Retirement Alternative. In the remaining 14 rural areas, the acreage in production under Bargaining Power Alternative B would be significantly lower than it would under the Land Retirement Alternative due to the relatively low demand for farm commodities under the former policy alternative. These 14 rural areas are located in: southeastern California, southwestern Kansas, central South Dakota, southeastern Oklahoma, northeastern Texas, southern Alabama, northern Georgia and western South Carolina. Even under the Land Retirement Alternative these rural areas wouldn't be major producers of the endogeous crops. They would account for only four percent of the cropland acreage in production under the Land Retirement Alternative.

X. POLICY IMPLICATIONS

In this study we attempt to quantitatively examine the potential effects of four government farm policies on selected key economic variables. While some of these variables relate directly to farmers and the quantity of output they produce, we also examine variables that indicate the potential impact of these four policy alternatives on workers in agriculturally-related industries and citizens of rural communities. We feel that only by considering the effects of government farm policies on variables such as these will decision-makers be able to effectively deal with the problem of insuring adequate farm incomes while simultaneously working to revitalize rural America.

While implementation of any one of the four farm policies would have a direct effect on the farming industry, it would also have secondary effects on rural America and the people living there. Historically, much has been written about the direct effects of government farm programs while little attention has been paid to the secondary effects of these programs. However in this study, we have attempted to quantitatively relate these secondary effects to alternative government farm policies.

Our analysis implies that none of the farm policy alternatives considered would provide a complete answer to the entire farm problem. This is especially evident when the regional impacts of the alternative policies are considered. Under each of them, some groups would benefit at the expense of another segment of the economy. Under the Free Market Alternative, any surplus productive capacity of American agriculture would by definition be eliminated--market prices would be determined at a level where all of

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the farm commodities that are produced would be sold. While this would lead to decreased net farm income, it would also enable total food costs to be lower than under the other three policy alternatives. In addition to having negative impacts on net farm income, the Free Market Alternative would also have negative secondary effects on the majority of the 150 rural areas (when compared to the Land Retirement Alternative). The amount of income and employment generated in all of the farm production regions except the Southern Plains region would be lower under the Free Market Alternative than under the other three policy alternatives.

While the total net farm income under the Land Retirement Alternative would be nearly equal to the total net farm income under Bargaining Power Alternative A, these two farm policies would have different effects on taxpayers and on consumers. Under the Land Retirement Alternative, taxpayers would contribute over $4.5 billion to the farming sector in the form of government payments for diverting cropland while under Bargaining Power Alternative A, taxpayers would not make this contribution. However, the total cost of food would be $3.8 billion higher under Bargaining Power Alternative A than under the Land Retirement Alternative.

When the secondary effects of these two policy alternatives are compared, the trade-offs between them become even more complicated. Nationally, the amount of income and employment generated under Bargaining Power Alternative A would be 19 percent higher than under the Land Retirement Alternative even though 34 rural areas would have less income and employment generated under Bargaining Power Alternative A. These 34 rural areas would be primarily located in four farm production regions (the Northern Plains, Southern Plains, Mountain and Southeastern regions). These results indicate that even though farmers as a whole could be equally well-off under the two alternative farm policies, the method of financing these farm policies and the secondary effects that may result from their implementation can have diverse impacts upon large segments of the nation.

The trade-offs that would result under Bargaining Power Alternative B would be mainly between consumers and farmers. Total food costs and total net farm income would both be at their highest level under this policy alternative. Also the amount of income and employment generated under Bargaining Power Alternative B would be higher than under the other three policy alternatives for almost all rural areas. These results imply that farmers and the residents of rural communities would be benefitted at the expense of consumers under a policy such as Bargaining Power Alternative B.

While we feel it is important to consider the secondary effects that alternative farm policies can have on rural communities, it does not follow that government farm programs of any type are the most effective means to aid rural communities. In this regard much more work is needed to determine the underlying causes of the problems of rural communities. Only after these causes are identified, can decision-makers develop effective programs to aid rural America. These programs could do such things as induce industries to develop in rural areas, create increased recreational opportunities or change the structure of the farming industry so as to encourage more labor intensive types of farm firms.

While we have indicated some of the possible effects of farm policies on certain economic variables, it remains for decision-makers and the public they represent to determine the weights that should be attached to these variables. Implementation of any of the policies considered would provide benefits to various groups within the American society. However, it is hoped that if research can indicate the magnitude of these benefits and the costs attached to them, the American public through its representatives could effectively select those policies which it most desired.

APPENDICES

Appendix A: Linear Programming

A linear programming model of interregional competition is used in this study to determine the impact of alternative farm policies on the quantity of major commodities produced, on the regional location of that production, and on net farm income.[1] In this programming model the United States is divided into 150 homogenous rural areas and 31 consuming regions (see Figures 1 and 2). These regions are determined so that county and state boundaries can be followed.

The following production activities are defined for each rural area to satisfy commodity demands in each consuming region:

a) Wheat production

b) Feedgrains production

c) Soybean production

d) Cotton lint production

e) Cottonseed oilmeal production

Wheat to feedgrain transfers are defined to allow the substitution of wheat for feedgrains. Transportation activities are defined by consuming region for wheat, feedgrains, and oilmeals to allow commodities produced in one consuming region to satisfy demand for the same commodity in another consuming region.

Commodity demands are entered for wheat, feedgrains, and oilmeals in each of the 31 consuming regions. Cotton lint demand is entered on a national basis only.

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[1] For a more detailed description of a similar programming model and its coefficients, see Mayer and Hargrove, Food Costs, Farm Incomes, and Crop Yields.

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Demands for livestock products are entered implicitly in the programming model through estimated feed requirements for wheat, feedgrains, and oilmeals on a consuming region basis.

The Free Market Alternative is based on a cost minimization model to minimize the summation of producing costs of the major commodities plus the costs of transferring wheat to feedgrains plus the cost of transporting commodities between consuming regions subject to the following constraints:

a) a maximum amount of land available for production of the major commodities in each of the 150 producing areas;

b) the production of the major commodities must satisfy the commodity demands in each consuming region;

c) soybean production is restricted to a maximum of one-half of the acres in any producing area except in rural areas in Louisiana, Arkansas, and Mississippi where 70 percent of the available land could be planted to soybeans.

The Land Retirement Alternative also is based on a cost minimization model with the same objective function and constraints as the Free Market Alternative but with the following additional restraints:

d) a certain proportion of the land in each producing area is "retired" from production based on historic patterns of land retirement;

e) an upper limit is placed on the amount of land that can be used to produce wheat, feedgrains, and cotton in each producing area.

Both Bargaining Power Alternatives evaluated in this study use the same basic coefficients as the Free Market and Land Retirement Alternatives, but are based on profit maximization instead of cost minimization models.

Selling activities are used to allow model determination of the net revenue in each consuming region. The primary difference between the two Bargaining Power Alternatives is the price level specified for each of them. Under both Bargaining Power Alternatives, the return from selling the major commodities minus the producing costs of the major commodities minus the cost of transferring wheat to feedgrains minus the cost of transporting commodities between consuming regions is maximized subject to the following constraints:

Constraints (a), (b), and (c) of the Free Market Alternative previously and (f) quotas that specify the maximum amount of land used for each crop in each producing area to balance supply and demand for each commodity for the price levels considered.

Appendix B: Secondary Impact Factors

A major purpose of this study is to determine the effect of alternative government farm policies on the economic well-being of rural communities and agriculturally-related industries. To accomplish this purpose, relationships between the production of major crops and indicators of economic well-being are determined. These indicators are the income and labor generation factors described in the "Secondary Impact..." section of the text. These factors are developed using relationships of input-output analysis. The purpose of this appendix is not to provide the reader with a detailed discussion of the theories underlying input-output analysis. Rather, this appendix is designed to provide the reader with an understanding of the relationships used to construct the income and labor generation factors of this study.[1]

A transactions table serves as a double-entry ledger and provides the basis of input-output analysis. Table B.1 presents a hypothetical transactions table that is used in the following discussion as an example of the methods used in this study. To construct the transactions table, each producing sector of the economy (sectors A, B, C, and H in Table B.1) is assigned a row and a column in the table. The row assigned to each sector describes the distribution of that sector's output throughout the economy. The column assigned to each sector shows from what sectors in the economy that sector purchases its inputs. This means that every element of the transactions table can be viewed in two ways. For example, the 16 million

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[1] Further discussion of these methods can be found in William H. Miernyk, The Elements of Input-Output Analysis, New York, Random House, 1965; William E. Martin and Harold O. Carter, "A California Interindustry Analysis Emphasizing Agriculture, Parts 1 and 2," California Agricultural Experiment Station, Giannini Foundation Research Report 250, 1962.

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Table B.1. Hypothetical input-output transactions table.

Output Input		Processing sectors			Households (H)	Final demands	Total Output
		A	B	C			
				(million dollars)			
Processing sectors	A	11	16	30	10	7	74
	B	14	6	9	20	24	73
	C	7	25	14	13	20	79
Households (H)		15	8	20	2	15	60
Payments sector		27	18	6	15	10	76
Total Outlay		74	73	79	60	76	362

dollar transaction between sectors A and B (first row, second column: Table B.1) can be looked upon either as the sale of part of sector A's output to sector B or as a purchase of inputs by sector B from sector A for use in the production of sector B's output

Sector H represents the household sector of the hypothetical economy. In input-output analysis the household sector can be included either as one of the producing sectors or as a part of final demands. In Table B.1, households are included as a producing sector; therefore, consumption purchases are regarded as inputs to the household sector's production process and the sale of labor is considered an output of the household sector.

The final demand sector in Table B.1 corresponds to an autonomous demand for the output of the producing sectors including such things as inventory accumulation, exports from the economy, government purchases, and other exogenous demands. The final payments sector in Table B.1 introduces the value of the inputs purchased from outside the economy's producing sectors including such items as imports, purchases from existing inventory stocks, or depreciation allowances. The final column of Table B.1, the total output column, is the summation of each sector's value of output sold throughout the economy and the final row of the table (total outlay) is the total purchases of inputs by each sector. Total output and total outlay must be equal for each of the producing sectors.

The direct requirements table (Table B.2) is constructed from the transactions table and simultaneously presents each transaction in the economy as a proportion of total output and as a proportion of total outlay for each sector of the economy. Each row entry represents the proportion of a

Table B.2. Hypothetical direct requirements table.

		Purchases by sector			Households
		A	B	C	(H)
			(million dollars)		
Production by sector	A	.1486	.2192	.3797	.1667
	B	.1892	.0822	.1139	.3333
	C	.0946	.3425	.1772	.2167
	Households (H)	.2027	.1096	.2532	.0333

Table B.3. Hypothetical interdependence table.

	A	B	C	Households (H)
		(million dollars)		
A	1.7466	.9829	1.2234	.9143
B	.6595	1.6473	.7971	.8603
C	.6353	.9690	1.9110	.8720
Households (H)	.6074	.6466	.8474	1.5521

million dollars worth of output sold to that column sector by that row industry. For example, sector C would sell \$94.6 thousand worth of its output to sector A and \$216.7 thousand worth of its output to sector H for every million dollars worth of inputs that column sector purchases from the row sector. In the example, every million dollars worth of inputs purchased by sector A contains \$202.7 thousand worth of the output of sector H. The direct requirements table is calculated by dividing each column element by the total output of that column sector after the total output is adjusted for inventory depletion.

Each entry of Table B.3, the interdependence table, measures the increase in output of that row sector generated by an increase of a million dollars of sales to final demand by the related column sector. These entries reflect not only the direct and indirect effects of the increased sales to final demand, but also the induced effects of the increased consumer spending by the household sector.[1] For example, the value of the output of sector A would increase by \$982.9 thousand for every million dollar increase of deliveries to final demand by sector B. Table B.3 is formed by first subtracting from an identity matrix the direct requirements table (Table B.2) and then inverting the resulting matrix.

The interdependence coefficients in Table B.3 measure the additional output forthcoming from every row sector generated by the production of an additional million dollars worth of output delivered to final demand by the respective column sector. To determine the effect of producing an additional million dollars worth of output by any sector, the coefficients in the column of that sector in Table B.3 must be adjusted. Table B.4 presents the adjusted interdependence matrix which is computed by dividing every element in each column by the diagonal element of that column. The coefficients in Table B.4 then represent the additional output of each row sector generated by the production of an additional million dollars worth of output by the column sector. For example, sector B produces $377.6 thousand worth of output for each million dollars worth of output from sector A. The income generation factor of a million dollars worth of output for any sector can be read directly from the household row of that column sector in Table B.4.[1]

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[1] The direct effects for an economy are given by the direct requirements table (Table B.2 in the example). The indirect effects are those increases in output that are due to the additional spending of all the producing sectors in the economy, but not allowing increased consumer expenditures. The induced effects reflect the increased output of each sector caused by increased consumer spending.

Table B.4. Hypothetical adjusted interdependency table.

	A	B	C	Households (H)
		(Million dollars)		
A	1.0000	.5967	.6402	.5891
B	.3776	1.0000	.4171	.5543
C	.3637	.5883	1.0000	.5618
Households* (H)	.3478	.3926	.4434	1.0000

*The income generation factor of each sector is equal to the household row entry for that sector.

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[1] The income generation factors developed in this study are related to, but not equivalent to, the type II income multipliers developed in other input-output studies. The type II income multiplier for a sector is equal to the income generation factor (the household row of that sector's column of Table B.4) divided by the direct income effect (the household row of that sector's column of Table B.2).

To calculate the impact of alternative policies on employment, the direct labor requirement for each sector must first be determined. The direct labor requirements of a producing sector are defined as the number of workers need in that sector to produce a million dollars of output by that sector. To determine the number of workers needed per million dollars of output in a sector, the average yearly employment for that sector is divided by that sector's gross domestic output. Table B.5 presents direct labor requirements for the hypothetical economy as the diagonal elements of a matrix with zeroes as the off-diagonal elements (household sector deleted).

Table B.5. Hypothetical direct labor requirements.

	A	B	C
		(Workers per million dollars)	
A	10.0	0.0	0.0
B	0.0	15.0	0.0
C	0.0	0.0	20.0

The Labor Generation Factor of each sector is determined using the direct labor requirements for each sector (Table B.5) and the adjusted interdependence matrix (Table B.4). Premultiplying the adjusted interdependence matrix by the matrix containing the direct labor requirements as diagonal elements determines the hypothetical employment matrix shown in Table B 6. Each element of the employment matrix represents the number of workers in that row sector required to produce a million dollars of output from that column sector. In the hypothetical example 6.4018 workers are required from sector A and 6.2567 workers from sector B to produce one million dollars worth of output from sector C (Table B.6). To determine the total number of workers needed to produce an additional million dollars worth of output from a given sector (the Labor generation factor of that sector), it is necessary to sum the column of the employment matrix representing that sector. For example, the Labor generation factor of sector A is 22.9382 workers per million dollars worth of output.[1]

Table B.6. Hypothetical employment matrix.

	A	B	C
	(Workers per million dollars)		
A	10.0000	5.9666	6.4018
B	5.6636	15.0000	6.2567
C	7.2746	11.7650	20.0000
Labor generation factor[*]	22.9382	32.7316	32.6585

[*] The Labor generation factor of each sector is equal to the summation of each column sector.

The previous discussion can be presented mathematically by the following set of equations. Assume the system under discussion has n processing sectors, m final demand sectors, and d final payments sectors. Let X_i be the output of each of the n processing sectors, x_{ij} be the amount of output of sector i used by sector j, and Y_{ik} be the demand for output of sector i by the kth final demand sector. Let the following system of equations (1) represent this system:

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[1] As in the case of the type II income multiplier, the type II employment multiplier for a sector is equal to the labor generation factor of that sector divided by the direct labor requirement of that sector.

$$
(1)\quad
\begin{array}{l}
X_1 = X_{11} + x_{12} + \ldots\ldots\ldots\ldots + x_{1n} + Y_{11} + \ldots\ldots\ldots\ldots + Y_{1m} \\
X_2 = x_{21} + x_{22} + \ldots\ldots\ldots\ldots + x_{2n} + Y_{21} + \ldots\ldots\ldots\ldots + Y_{2m} \\
\vdots \\
X_n = x_{n1} + x_{n2} + \ldots\ldots\ldots\ldots + x_{nn} + Y_{n1} + \ldots\ldots\ldots\ldots + Y_{nm} \\
\vdots \\
X_{n+d} = x_{n+d1} + x_{n+d2} + \ldots\ldots\ldots\ldots + x_{n+dn} + Y_{n+d1} + \ldots\ldots\ldots\ldots + Y_{n+dm}
\end{array}
$$

Assuming constant technical coefficients for the n processing sectors, new terms can be calculated as in (2).

(2) $a_{ij} = x_{ij}/X_j$ $\qquad$ $i, j = 1, \ldots\ldots n$

Deleting the final payments sector the producing sectors can now be summarized as in (3) for all n producing sectors.

(3) $X_i - \sum_{j=1}^{n} a_{ij}X_j = \sum_{k=1}^{m} Y_{ik}$ $\qquad$ $i = 1, \ldots\ldots n$

The system defined by (3) can be expressed equivalently in matrix form as in (4) or (5).

$$
\begin{bmatrix}
(1 - a_{11}) & - a_{12} & \ldots\ldots & - a_{1n} \\
- a_{21} & (1 - a_{22}) & \ldots & - a_{2n} \\
\vdots & \vdots & & \\
- a_{n1} & - a_{n2} & \ldots\ldots & (1 - a_{nn})
\end{bmatrix}
\begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_n \end{bmatrix}
=
\begin{bmatrix} Y_1 \\ Y_2 \\ \vdots \\ Y_n \end{bmatrix}
$$

or

(5) $(I - A)\,X = Y$

where A is an n x n matrix of technical coefficients, I is an identity matrix of the same dimension as A, X is a n x 1 column vector of outputs, and Y is a n x 1 column vector of final demands. To solve this system for the X vector, the (I - A) matrix is inverted to form an interdependency table (such as Table B.3 previously). Define a new matrix R, where $R = (I - A)^{-1}$, which when expanded appears as in (6).

$$(6) \quad R = \begin{bmatrix} r_{11} & r_{12} & \cdots\cdots\cdots & r_{1n} \\ r_{21} & r_{22} & \cdots\cdots\cdots & r_{2n} \\ \vdots & \vdots & & \vdots \\ r_{n1} & r_{n2} & \cdots\cdots\cdots & r_{nn} \end{bmatrix}$$

where r_{ij} is the amount of output of sector i required to deliver one unit of output of sector j to final demand. Define a further relationship:

$$s_{ij} = r_{ij}/r_{ii} \text{ for all } i \text{ and } j$$

to form a new matrix S in (7)

$$(7) \quad S = \begin{bmatrix} s_{11} & s_{12} & \cdots\cdots\cdots & s_{1n} \\ s_{21} & s_{22} & \cdots\cdots\cdots & s_{2n} \\ \vdots & \vdots & & \vdots \\ s_{n1} & s_{n2} & & s_{nn} \end{bmatrix}$$

where each s_{ij} represents the amount of output of sector i required to produce one unit of output of sector j. Matrix S corresponds to Table B.4 discussed previously.

The secondary impact factors just discussed are related to value of output. The income and labor generation factors developed for this study deal with the secondary effects of production of four commodities (wheat, feedgrains, soybeans, and cotton). To estimate the total income or labor generation effect of these commodities for any region; the secondary impact factors developed from Schluter's input model were multiplied times the value of output of these commodities determined in the linear programming model (discussed in Appendix A).

Appendix C: Consumer Food Costs

Total consumer expenditures for food are estimated in this study by summing the projected consumer expenditures in 1975 for the following commodities: beef and veal, pork, lamb and mutton, edible offal, broilers, turkeys, eggs, dairy products, bakery products, fruits and vegetables, grain mill products, and miscellaneous items. Projections of consumer expenditures for each of these categories are estimated for each of the policy solutions.

Consumer expenditures in 1975 for beef and veal, pork, lamb and mutton, broilers, turkeys, eggs, and dairy products are estimated with Equation (1):

(1) $E_{i75} = (P_{iR75})(C_{i75})(N_{75})$; $i = 1, \ldots, 7$

where

E_{i75} = Consumer expenditures for the i-th commodity in 1975

C_{i75} = Per capita consumption of the i-th commodity in 1975 (retail equivalent weight basis for meat and poultry products)

P_{iR75} = Retail price of the i-th commodity in 1975 (in 1966 equivalent dollars)

N_{75} = Population estimate for 1975

Consumer expenditures for edible offal in 1975 are estimated from Equation (2).

(2) $E_{et} = -1074.174 + 2.0602E_{et-1} + 56.67T$

where

E_{et} = Consumer expenditure for edible offal in year t

T = Time; 1951 = 1, 1952 = 2, 1975 = 25.

Consumer expenditures for fruits and vegetables, bakery products, and miscellaneous items for 1975 are estimated using the relationships given by Equation (3).

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(3) $E_{it} = b_{oi} + b_{1i}E_{it-1} + b_{2i}I_t$

where

E_{it} = Consumer expenditures for the i-th commodity in year t

I_t = Per capita income in year t (in 1954 constant dollars).

The estimates for b_o, b_1, and b_2 for each of the commodities are given in Equations (4), (5), and (6).

(4) $E_{fv,t} = -1484.46 + 0.8633E_{fv,t-1} + 2.1775I_t$

where

$E_{fv,t}$ = Consumer expenditures for fruits and vegetables in year t.

(5) $E_{b,t} = -707.226 + 0.8672E_{bt-1} + 0.9971I_t$

where

$E_{b,t}$ = Consumer expenditures for bakery products in year t.

(6) $E_{m,t} = -545.50 + 1.0003_{mt-1} + 0.3611I_t$

where

E_{gt} = Consumer expenditure for grain mill products in year t

T = Time; 1951 = 1, 1952 = 2,......, 1975 = 25.

For each of the policy alternatives Appendix Table C.1 presents the estimates of consumer expenditures in 1975 for each commodity estimated in Equations 1 through 7.

Appendix Table C.1. Estimated total consumer expenditures for the individual commodities under each of the policy alternatives in 1975.

Item	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	1975 Estimated consumer expenditures			
	(million dollars)[a]			
Meat products	33,660	36,545	39,107	41,755
Beef and veal	20,209	21,983	23,536	25,156
Pork	6,975	8,062	9,054	10,095
Lamb and mutton	367	391	408	395
Edible offal	6,109	6,109	6,190	6,109
Poultry products	6,529	7,704	8,939	10,565
Broilers	2,939	4,114	5,349	6,975
Turkeys	541	541	541	541
Eggs	3,049	3,049	3,049	3,049
Dairy products	22,477	22,477	22,477	22,477

Appendix Table C.1. (continued)

Item	1975 Estimated consumer expenditures			
	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Other	61,061	61,061	61,061	61,061
Fruit and vegetables	28,143	28,143	28,143	28,143
Grain mill products	5,016	5,016	5,016	5,016
Bakery products	12,982	12,982	12,982	12,982
Miscellaneous	14,920	14,920	14,920	14,920
Total	123,727	127,787	131,584	135,858

a/ All values are measured in 1970 equivalent dollars with no adjustment for inflation to 1975.

Appendix Table D.1. Indices comparing the amount of income generated under the Land Retirement Alternative with the amount of income generated under each of the other three policy alternatives for the 40 states that contain rural areas in this model.

Farm production region	State	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	**Bargaining Power** Alternative B
Northeast	**New York**	131.7	100.0	150.3	163.4
	Pennsylvania	4.0	100.0	128.4	139.7
	New Jersey	37.6	100.0	113.3	122.1
	Maryland	39.6	100.0	161.0	174.6
Corn Belt	**Ohio**	88.0	100.0	121.0	131.5
	Indiana	103.9	100.0	115.4	124.8
	Illinois	86.5	100.0	125.2	135.3
	Iowa	93.3	100.0	131.8	142.4
	Missouri	80.0	100.0	128.2	140.8
Lake States	**Michigan**	105.1	100.0	145.0	157.1
	Wisconsin	87.1	100.0	120.2	131.9
	Minnesota	86.6	100.0	114.6	124.0
Appalachian	**Virginia**	0.0	100.0	120.9	130.9
	North Carolina	98.6	100.0	130.4	146.1
	Kentucky	124.3	100.0	141.2	153.4
	Tennessee	34.0	100.0	129.7	147.0

Appendix Table D.1. (continued)

Farm production region	State	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Southeast	South Carolina	53.0	100.0	145.5	152.1
	Georgia	82.9	100.0	116.1	123.7
	Florida	45.5	100.0	105.7	113.6
	Alabama	40.9	100.0	121.9	127.5
Delta States	Mississippi	52.3	100.0	126.5	167.6
	Arkansas	47.7	100.0	122.5	136.2
	Louisiana	91.6	100.0	120.1	125.0
Southern Plains	Oklahoma	115.4	100.0	107.9	113.8
	Texas	128.4	100.0	103.8	109.3
Northern Plains	North Dakota	40.7	100.0	117.0	147.0
	South Dakota	55.9	100.0	103.7	128.8
	Nebraska	93.5	100.0	106.5	116.1
	Kansas	89.3	100.0	111.1	119.5
Mountain	Montana	85.5	100.0	126.9	136.0
	Idaho	46.9	100.0	135.7	145.3
	Wyoming	0.0	100.0	150.0	161.4

Appendix Table D.1. (continued)

Farm production region	State	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Mountain	New Mexico	111.1	100.0	134.4	140.7
	Arizona	0.8	100.0	103.9	107.5
	Utah	74.6	100.0	98.2	105.0
Pacific	Washington	87.2	100.0	128.7	137.8
	Oregon	99.2	100.0	161.1	172.6
	California	42.0	100.0	106.1	109.1

Appendix Table D.2. Indices comparing the amount of income generated under the Land Retirement Alternative with the amount of income generated under each of the other three policy alternatives for the 150 rural areas.

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Northeast	New York	1	133.7	100.0	150.3	163.4
	Pennsylvania	2	4.0	100.0	128.4	139.7
	New Jersey	3	37.6	100.0	113.3	122.1
	Maryland	4	39.6	100.0	161.0	174.6
Corn Belt	Ohio	36	113.8	100.0	82.0	102.0
		37	111.6	100.0	87.6	95.8
		38	85.6	100.0	107.3	116.2
		39	84.9	100.0	128.5	138.4
	Indiana	40	115.6	100.0	96.5	104.4
		42	84.9	100.0	107.1	115.6
		43	109.9	100.0	117.0	126.6
		44	83.2	100.0	130.0	140.2
	Illinois	50	97.7	100.0	123.7	134.8
		51	81.3	100.0	120.4	129.9
		52	61.3	100.0	135.2	145.6
		53	83.7	100.0	159.7	170.2
		54	77.1	100.0	147.2	157.4
		55	79.7	100.0	117.6	126.7
	Iowa	66	85.4	100.0	125.0	135.9
		67	87.9	100.0	131.0	141.5
		68	100.2	100.0	134.9	147.3

Appendix Table D.2. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
		69	85.8	100.0	134.4	146.1
		70	80.0	100.0	131.3	142.8
		71	100.2	100.0	133.1	143.5
		72	104.7	100.0	130.8	141.9
	Missouri	32	73.0	100.0	163.9	192.8
		63	99.8	100.0	155.4	168.1
		64	0.0	100.0	112.0	122.1
		65	97.8	100.0	119.4	128.3
Lake States	Michigan	45	105.6	100.0	128.7	139.3
		46	104.5	100.0	161.7	175.4
	Wisconsin	47	0.0	100.0	148.1	162.9
		48	99.4	100.0	121.8	133.7
		49	101.6	100.0	118.9	130.8
		76	91.8	100.0	91.6	100.0
	Minnesota	73	101.2	100.0	112.7	121.9
		74	81.4	100.0	119.1	128.7
		75	100.0	100.0	108.9	118.2
		77	80.0	100.0	116.3	125.5
		78	0.0	100.0	107.0	117.3
		79	97.9	100.0	120.6	130.4
Appalachian	Virginia	5	0.0	100.0	115.9	126.7
		6	0.0	100.0	127.8	136.7

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Appendix Table D.2. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Southeast	North Carolina	7	144.0	100.0	166.3	176.6
		8	43.6	100.0	114.3	123.9
		9	45.8	100.0	88.2	116.8
		10	111.7	100.0	132.7	151.7
		16	0.0	100.0	81.8	79.8
	Kentucky	33	105.8	100.0	133.5	145.2
		34	132.4	100.0	163.2	174.9
		35	141.1	100.0	108.0	118.3
		41	140.3	100.0	174.6	190.1
	Tennessee	28	0.0	100.0	115.5	123.2
		29	51.6	100.0	137.1	159.2
	South Carolina	11	57.2	100.0	169.9	178.4
		12	47.6	100.0	151.1	162.5
		15	56.3	100.0	179.1	185.9
		17	47.9	100.0	87.9	91.6
		18	43.0	100.0	54.5	60.9
	Georgia	13	135.9	100.0	172.7	206.5
		14	105.0	100.0	127.1	135.5
		24	9.4	100.0	77.7	80.6
		26	68.7	100.0	99.3	102.6
	Florida	19	45.5	100.0	105.7	113.6

Appendix Table D.2. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	Alabama	20	65.5	100.0	217.3	263.2
		21	48.7	100.0	71.6	72.3
		22	0.0	100.0	97.8	99.6
		23	0.0	100.0	97.8	99.6
		25	41.0	100.0	142.1	147.5
Delta States	**Mississippi**	27	50.0	100.0	144.3	148.5
		30	31.5	100.0	115.4	117.8
		56	64.3	100.0	106.2	211.9
	Arkansas	31	39.2	100.0	113.4	121.8
		59	39.1	100.0	93.9	94.8
		60	51.2	100.0	130.8	150.2
		61	55.2	100.0	122.5	125.8
		62	83.4	100.0	113.0	117.6
	Louisiana	57	89.8	100.0	124.4	129.7
		58	94.6	100.0	59.1	59.8
		120	276.5	100.0	97.6	98.5

Appendix Table D.2. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Southern Plains	Oklahoma	105	90.3	100.0	90.9	102.5
		106	93.6	100.0	156.1	166.7
		107	10.9	100.0	101.5	108.3
		108	58.5	100.0	102.1	108.6
		109	50.3	100.0	109.4	114.4
		110	50.7	100.0	63.3	65.6
		111	186.9	100.0	94.9	98.2
	Texas	112	171.6	100.0	108.2	115.0
		113	63.4	100.0	101.2	103.7
		114	192.5	100.0	110.4	113.6
		115	147.0	100.0	50.6	52.7
		116	235.9	100.0	127.5	133.3
		117	52.8	100.0	109.7	114.2
		118	61.9	100.0	73.6	76.0
		119	36.4	100.0	57.3	57.9
		121	0.0	100.0	97.3	98.1
		122	896.3	100.0	356.2	434.9
		123	0.0	100.0	104.5	108.8
		124	206.8	100.0	112.6	118.3
		125	48.5	100.0	102.4	105.5
		126	204.8	100.0	109.4	115.6

Appendix Table D.2. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	Texas	127	65.4	100.0	45.9	168.2
		128	0.0	100.0	119.5	123.4
Northern Plains	North Dakota	80	98.2	100.0	160.6	172.8
		81	28.5	100.0	141.0	151.8
		82	0.0	100.0	149.2	159.8
		83	0.0	100.0	0.0	118.4
		84	94.7	100.0	115.0	123.5
	South Dakota	85	0.0	100.0	93.4	99.1
		86	0.0	100.0	66.0	148.8
		87	39.4	100.0	122.5	133.8
		88	109.6	100.0	29.1	30.9
		89	89.1	100.0	125.0	136.7
	Nebraska	90	102.5	100.0	120.3	131.2
		91	133.8	100.0	107.9	116.1
		92	101.5	100.0	123.6	132.6
		93	87.5	100.0	90.2	98.9
		94	62.6	100.0	97.5	106.2
		95	97.3	100.0	103.3	112.7
	Kansas	96	91.1	100.0	102.7	111.3
		97	102.1	100.0	114.5	123.0
		98	86.2	100.0	136.1	145.5
		99	97.8	100.0	130.0	140.1

Appendix Table D.2. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	Kansas	100	86.9	100.0	120.4	130.2
		101	89.1	100.0	121.6	130.8
		102	92.6	100.0	157.1	168.5
		103	83.7	100.0	116.2	124.3
		104	87.6	100.0	72.8	78.5
Mountain	Montana	136	0.0	100.0	96.3	102.2
		137	85.4	100.0	113.1	121.3
		138	93.5	100.0	149.5	160.1
		139	91.5	100.0	139.3	149.4
	Idaho	140	26.7	100.0	131.9	141.3
		146	95.7	100.0	145.0	155.1
	Wyoming	135	0.0	100.0	150.1	161.4
	Colorado	131	0.0	100.0	116.4	126.2
		132	215.9	100.0	84.8	93.3
		133	33.0	100.0	114.5	122.8
		134	154.8	100.0	121.6	131.8
	New Mexico	129	253.5	100.0	197.2	212.1
		130	37.9	100.0	102.1	104.0
	Arizona	142	0.8	100.0	103.9	107.5
	Utah	141	74.6	100.0	98.2	106.0
Pacific	Washington	148	95.7	100.0	157.1	168.2
		149	91.6	100.0	116.8	124.8

Appendix Table D.2. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	Washington	150	47.3	100.0	94.3	101.3
	Oregon	147	99.2	100.0	161.1	172.6
	California	143	218.7	100.0	79.7	80.5
		144	18.9	100.0	106.7	109.3
		145	98.9	100.0	149.3	163.5

Appendix Table D.3. Indices comparing the amount of employment generated under the Land Retirement Alternative with the amount of employment generated under each of the other three policy alternatives for the 40 states which contain rural areas in this model.

Farm production region	State	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Northeast	New York	133.7	100.0	113.7	123.1
	Pennsylvania	5.4	100.0	127.1	137.8
	New Jersey	46.6	100.0	108.2	115.9
	Maryland	48.5	100.0	148.3	160.0
Corn Belt	Ohio	89.8	100.0	125.7	136.5
	Indiana	102.7	100.0	117.8	127.1
	Illinois	86.9	100.0	126.1	136.2
	Iowa	93.8	100.0	132.3	143.3
	Missouri	82.2	100.0	134.0	147.3
Lake States	Michigan	107.1	100.0	141.7	153.3
	Wisconsin	85.0	100.0	117.3	128.7
	Minnesota	86.9	100.0	114.5	123.7
Appalachian	Virginia	0.0	100.0	121.9	132.2
	North Carolina	97.5	100.0	133.3	150.9
	Kentucky	129.3	100.0	147.4	160.5
	Tennessee	30.0	100.0	124.0	138.9
Southeast	South Carolina	46.6	100.0	161.3	168.7
	Georgia	83.5	100.0	115.9	123.5
	Florida	37.4	100.0	112.8	121.3
	Alabama	33.3	100.0	131.6	137.1

Appendix Table D.3. (continued)

Farm production region	State	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Delta States	**Mississippi**	50.7	100.0	133.2	179.9
	Arkansas	43.2	100.0	120.5	133.1
	Louisiana	91.0	100.0	116.9	121.3
Southern Plains	**Oklahoma**	124.1	100.0	107.7	113.3
	Texas	130.5	100.0	103.3	108.5
Northern Plains	**North Dakota**	40.8	100.0	116.6	146.7
	South Dakota	55.4	100.0	103.3	128.1
	Nebraska	93.7	100.0	106.8	116.4
	Kansas	89.4	100.0	111.0	119.3
Mountain	**Montana**	85.5	100.0	125.7	134.7
	Idaho	46.9	100.0	136.9	146.7
	Wyoming	0.0	100.0	152.1	163.6
	Colorado	100.3	100.0	112.6	121.7
	New Mexico	124.1	100.0	136.1	143.0
	Arizona	0.9	100.0	105.0	109.0
	Utah	72.0	100.0	96.3	104.0
Pacific	**Washington**	86.6	100.0	125.6	134.5
	Oregon	99.2	100.0	163.8	175.6
	California	44.0	100.0	108.8	112.2

Appendix Table D.4. Indices comparing the amount or employment generated under the Land Retirement Alternative with the amount of employment generated under each of the other three policy alternatives for the 150 rural areas.

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Northeast	New York	1	133.7	100.0	113.7	123.1
	Pennsylvania	2	5.4	100.0	127.1	137.8
	New Jersey	3	46.6	100.0	108.2	115.9
	Maryland	4	48.5	100.0	148.3	160.0
Corn Belt	Ohio	36	111.5	100.0	81.5	103.8
		37	109.1	100.0	88.1	96.3
		38	92.5	100.0	111.3	120.3
		39	86.4	100.0	133.9	144.1
	Indiana	40	112.8	100.0	97.9	105.9
		42	85.7	100.0	110.0	118.7
		43	108.3	100.0	120.0	129.6
		44	84.2	100.0	128.2	138.0
	Illinois	50	96.6	100.0	124.4	135.4
		51	82.3	100.0	122.4	131.9
		52	67.7	100.0	137.4	147.7
		53	83.7	100.0	149.2	158.8
		54	80.3	100.0	143.3	153.1
		55	81.0	100.0	121.1	130.3
	Iowa	66	87.1	100.0	125.3	136.2
		67	89.2	100.0	131.4	141.9
		68	99.7	100.0	135.8	148.2

Appendix Table D.4. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	Iowa	69	88.0	100.0	135.0	146.7
		70	83.6	100.0	131.6	143.0
		71	98.8	100.0	133.5	143.7
		72	103.0	100.0	131.0	142.1
	Missouri	32	80.7	100.0	184.8	217.5
		63	97.5	100.0	139.6	150.7
		64	0.0	100.0	118.0	128.4
		65	99.0	100.0	123.2	132.2
Lake States	Michigan	45	105.8	100.0	135.3	146.3
		46	108.2	100.0	147.4	159.6
	Wisconsin	47	0.0	100.0	125.1	137.6
		48	98.9	100.0	122.2	134.0
		49	101.0	100.0	118.3	130.1
		76	91.9	100.0	89.4	97.5
	Minnesota	73	98.9	100.0	113.0	122.1
		74	83.1	100.0	120.8	130.3
		75	98.0	100.0	109.5	118.7
		77	81.9	100.0	119.3	128.7
		78	0.0	100.0	109.2	119.7
		79	98.2	100.0	107.5	116.1
Appalachian	Virginia	5	0.0	100.0	117.9	128.8
		6	0.0	100.0	127.3	136.7

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Appendix Table D.4. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Southeast	North Carolina	7	152.8	100.0	167.7	178.3
		8	36.8	100.0	117.6	127.5
		9	39.3	100.0	93.0	124.9
		10	110.0	100.0	136.5	158.5
		16	0.0	100.0	84.7	83.8
	Kentucky	33	111.8	100.0	147.3	160.4
		34	138.8	100.0	176.9	189.9
		35	144.8	100.0	110.7	121.3
		41	141.0	100.0	165.7	181.2
	Tennessee	28	0.0	100.0	127.0	135.3
		29	42.3	100.0	122.7	140.4
	South Carolina	11	51.2	100.0	193.1	202.9
		12	41.1	100.0	160.3	173.1
		15	50.2	100.0	197.9	205.4
		17	41.0	100.0	100.9	105.1
		18	36.1	100.0	61.9	69.1
	Georgia	13	136.1	100.0	161.6	192.0
		14	104.2	100.0	124.2	132.4
		24	10.2	100.0	84.3	87.4
		26	64.8	100.0	104.3	107.7
	Florida	19	37.4	100.0	112.8	121.3

Appendix Table D.4. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	Alabama	20	60.9	100.0	202.2	245.0
		21	41.5	100.0	84.1	84.9
		22	0.0	100.0	97.3	99.1
		23	0.0	100.0	97.3	999.0
		25	33.1	100.0	153.9	159.6
Delta States	Mississippi	27	44.9	100.0	165.5	170.7
		30	27.2	100.0	116.5	119.1
		56	67.9	100.0	96.2	216.1
	Arkansas	31	34.3	100.0	109.7	117.6
		54	35.0	100.0	94.7	96.5
		60	46.9	100.0	128.4	146.0
		61	52.0	100.0	126.1	129.5
		62	82.7	100.0	118.9	124.1
	Louisiana	57	89.1	100.0	120.6	125.3
		58	95.6	100.0	62.9	63.6
		120	276.1	100.0	97.3	98.2
Southern Plains	Oklahoma	105	92.1	100.0	93.5	105.0
		106	93.6	100.0	156.9	167.6
		107	10.7	100.0	101.3	108.0
		108	52.5	100.0	103.5	109.9
		109	45.9	100.0	111.4	116.4
		110	45.6	100.0	68.5	70.8
		111	200.0	100.0	94.8	97.8

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Appendix Table D.4. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	Texas	112	180.2	100.0	107.2	113.6
		113	58.4	100.0	100.6	102.8
		114	196.3	100.0	108.5	111.4
		115	164.4	100.0	54.2	56.3
		116	246.9	100.0	124.0	129.3
		117	47.0	100.0	108.4	112.6
		118	57.5	100.0	78.4	80.8
		119	31.1	100.0	63.0	63.6
		121	0.0	100.0	97.1	97.9
		122	1,023.3	100.0	348.6	425.0
		123	0.0	100.0	103.5	107.4
		124	219.2	100.0	110.9	116.1
		125	42.4	100.0	101.5	104.3
		126	219.8	100.0	108.2	113.8
		127	63.9	100.0	47.4	202.4
		128	0.0	100.0	116.1	119.6
Northern Plains	North Dakota	80	97.9	100.0	158.0	170.0
		81	28.6	100.0	139.8	150.5
		82	0.0	100.0	148.0	158.5
		83	0.0	100.0	0.0	122.3
		84	94.6	100.0	114.9	123.4

Appendix Table D.4. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
	South Dakota	85	0.0	100.0	93.4	99.1
		86	0.0	100.0	66.0	146.3
		87	40.0	100.0	122.9	134.3
		88	109.7	100.0	29.1	30.9
		89	88.9	100.0	124.8	136.4
	Nebraska	90	102.2	100.0	120.3	131.3
		91	133.8	100.0	106.5	114.6
		92	101.5	100.0	122.4	131.3
		93	87.9	100.0	90.3	98.9
		94	64.0	100.0	98.4	107.2
		95	97.3	100.0	103.9	113.3
	Kansas	96	91.6	100.0	103.4	112.0
		97	101.9	100.0	114.7	123.1
		98	86.6	100.0	134.3	143.5
		99	97.0	100.0	128.0	137.9
		100	87.1	100.0	118.6	128.3
		101	89.1	100.0	120.1	129.2
		102	92.6	100.0	155.5	166.7
		103	83.8	100.0	115.4	123.5
		104	88.2	100.0	74.1	79.9

Appendix Table D.4. (continued)

Farm production region	State	Rural area	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
Mountain	Montana	136	0.0	100.0	96.3	102.2
		137	85.4	100.0	110.3	118.3
		138	93.5	100.0	150.9	161.7
		139	91.5	100.0	140.8	151.0
	Idaho	140	26.7	100.0	133.1	142.7
		146	95.7	100.0	146.1	156.4
	Wyoming	135	0.0	100.0	152.1	163.6
	Colorado	131	0.0	100.0	114.7	124.4
		132	215.9	100.0	84.8	93.3
		133	32.3	100.0	113.1	121.3
		134	154.8	100.0	119.8	130.0
	New Mexico	129	253.5	100.0	189.3	204.0
		130	43.9	100.0	103.1	105.3
	Arizona	142	0.9	100.0	105.0	109.0
	Utah	141	72.0	100.0	96.3	104.0
Pacific	Washington	148	95.7	100.0	159.5	170.8
		149	91.6	100.0	111.3	119.0
		150	44.5	100.0	90.6	97.4
	Oregon	147	99.2	100.0	163.8	175.6
	California	143	214.3	100.0	78.5	79.3
		144	20.8	100.0	109.3	112.3
		145	98.9	100.0	157.5	172.5

Appendix Table E.1. Distribution of the acreage used for wheat production under each of the policy alternatives for the United States and for the ten farm production regions, with actual 1969 data for comparison.

Region	Actual 1969[a]	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
			(Thousand acres)		
United States	47,555	54,695	46,417	50,214	44,941
Northeast	680	819	967	792	673
Corn Belt	4,345	4,892	2,098	6,717	6,016
Lake States	1,510	4,926	3,981	2,307	1,961
Appalachian	776	1,185	395	512	497
Southeast	290	133	180	159	143
Delta States	464	1,470	293	148	316
Southern Plains	7,019	10,551	7,442	8,176	6,949
Northern Plains	21,311	21,425	23,433	20,980	19,527
Mountain	7,555	4,549	4,469	7,258	6,169
Pacific	3,605	4,745	3,159	3,165	2,690

[a] Crop Production 1969 Annual Summary, USDA SRS, December, 1969.

Appendix Table E.2. Distribution of the acreage used for feed grains production under each of the policy alternatives for the United States and for the ten farm production regions, with actual 1969 data for comparison.

Region	Actual 1969[a]	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
		(Thousand	acres)		
United States	95,427	87,501	86,225	82,299	75,149
Northeast	3,097	.	1,582	1,912	1,721
Corn Belt	33,132	42,002	38,154	32,822	29,540
Lake States	13,417	13,216	11,327	12,741	11,466
Appalachian	3,986	2,602	2,930	2,797	2,612
Southeast	3,082	2,882	2,355	2,798	2,518
Delta States	779	430	178	588	528
Southern Plains	8,711	3,462	5,274	6,436	5,806
Northern Plains	21,699	15,967	17,835	17,302	16,545
Mountain	4,666	5,526	5,142	3,181	2,863
Pacific	2,858	1,414	1,448	1,722	1,550

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[a] Crop Production 1969 Annual Summary.

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Appendix Table E.3. Distribution of the acreages used for soybean production under each of the policy alternatives for the United States and for the ten farm production regions, with actual 1969 data for comparison.

Region	Actual 1969[a]	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
		(Thousand	acres)		
United States	40,857	48,082	41,422	37,352	32,199
Northeast	443	588	726	374	318
Corn Belt	20,651	20,854	17,344	18,760	15,946
Lake States	3,855	3,336	3,354	3,981	3,384
Appalachian	2,972	2,759	2,531	2,306	2,028
Southeast	2,236	3,582	3,943	2,020	1,754
Delta States	8,126	8,193	8,089	7,541	6,744
Southern Plains	466	1,529	1,549	243	217
Northern Plains	2,108	7,241	3,881	2,127	1,808
Mountain	.	.	.	.	.
Pacific	.	.	.	.	.

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[a] Crop Production 1969 Annual Summary.

Appendix Table E.4. Distribution of the acreage used for cotton production under each of the policy alternatives for the United States and for the ten farm production regions, with actual 1969 data for comparison.

Region	Actual 1969[a]	Free Market Alternative	Land Retirement Alternative	Bargaining Power Alternative A	Bargaining Power Alternative B
		(Thousand	acres)		
United States	11,093	11,082	10,244	9,967	9,010
Northeast	.	.	.	.	.
Corn Belt	305	.	.	233	198
Lake States	---	.	.	.	.
Appalachian	586	.	479	679	661
Southeast	1,229	.	1,186	1,565	1,333
Delta States	2,670	553	2,090	2,010	2,131
Southern Plains	5,140	10,374	5,544	4,658	3,988
Northern Plains	---	.	.	.	.
Mountain	458	.	360	332	283
Pacific	705	155	585	490	416

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a/ Crop Production 1969 Annual Summary.

Table E.5. **Distribution of the acreages used for production of the major crop commodities under each of the policy alternatives for the United States and for each of the ten farm production regions, with actual 1969 data for comparison.**

Region	Actual 1969[a]	Free Market Alternative	Land Retirement Alternative	**Bargaining Power** Alternative A	**Bargaining Power** Alternative B
			(Thousand acres)		
United States	194,932	201,359	184,308	179,830	161,299
Northeast	4,220	1,407	3,275	3,078	2,712
Corn Belt	58,433	67,748	57,596	58,532	51,700
Lake States	18,782	21,478	18,661	19,029	16,812
Appalachian	8,320	6,546	6,335	6,295	5,797
Southeast	6,837	6,597	7,668	6,546	5,748
Delta State	12,039	10,647	10,650	10,287	9,719
Southern Plains	21,336	25,916	19,810	19,512	16,960
Northern Plains	45,118	44,633	45,150	40,409	37,880
Mountain	12,679	10,075	9,971	10,771	9,315
Pacific	7,168	6,314	5,192	5,377	4,656

[a] Crop Production 1969 Annual Summary.

PURPOSE OF THE REGIONAL CENTER

THE ESTABLISHMENT of the North Central Regional Center for Rural Development in 1971 represented a commitment to a new type of economic and social development, one that includes rural nonfarm segments of our society—the rural towns and cities—as well as the commercial-farm sector of the region.

The objective of Center research is to build a body of knowledge for improving the quality of life for rural people. People decide personal and public matters on the basis of inherent knowledge and perception of their total environment. It is these decisions that, when aggregated, change the structure of the economy and ecology of the population, influence the quality of life and structure the future. A unique opportunity exists to supply new knowledge to assist rural people and to improve the processes by which people act and make decisions.

Our large cities have problems of overcrowding and deterioration of public services and facilities. Rural America's problem is that of population isolation, restricted employment opportunities, and scarcity of public and private services. If all these problems are to be resolved, we need to develop a planning horizon long enough so that all major factors that are changing the makeup of both city and countryside become flexible and subject to change. Thus, research must essentially encompass a broad, long-range, comprehensive appraisal of all factors involved in the economic and social life of our citizens.

Indeed, the research effort becomes a massive interdisciplinary and logistic framework. It is this that leads the Regional Center to establish cooperation and coordination with all agencies and institutions to maximize rural development efforts and efficiencies of research planning and implementation. It is to this specific set of problems and potentials that the North Central Regional Center for Rural Development is directing its activities.

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